



## **A Pollution Prevention Assessment and Guidance**

Washington State Department of Ecology  
Hazardous Waste and Toxics Reduction Program  
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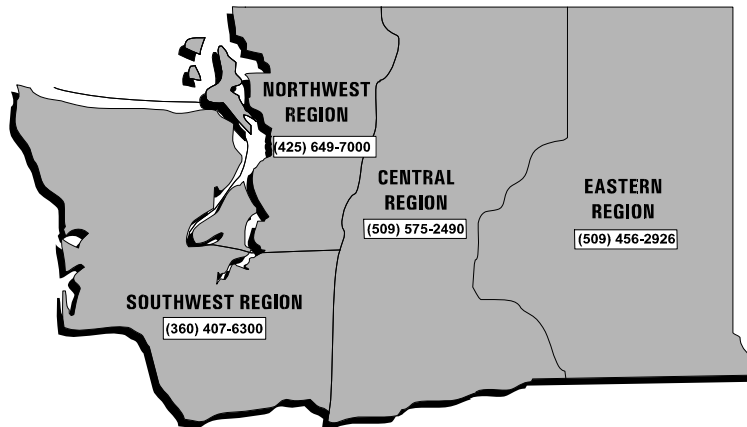
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# Table of Contents

<b>I</b>	<b>Executive Summary</b>	<b>3</b>
<b>II</b>	<b>Overview &amp; Site Visits</b>	<b>4</b>
<b>III</b>	<b>Pollution Prevention Summary</b>	<b>5</b>
	A. Baseline Pollution Prevention Practices	<b>5</b>
	B. Recommended Additional P2 Practices	<b>6</b>
<b>IV</b>	<b>Metal Working Fluid Maintenance</b>	<b>8</b>
	A. Metal Working Fluid Maintenance Program	<b>8</b>
	B. Selection Criteria	<b>9</b>
	C. Metal Working Fluid Recycling	<b>10</b>
<b>V</b>	<b>Spent Metal Working Fluid Disposal</b>	<b>14</b>
	A. Designation under Existing Regulations	<b>14</b>
	B. Designation under Proposed New Regulations	<b>17</b>
	C. Managing as Dangerous Waste	<b>17</b>
	D. Managing as Used Oil	<b>21</b>
	E. Evaporator Issues	<b>21</b>
<b>VI</b>	<b>Chip Management</b>	<b>24</b>
	A. Chip Recycling	<b>24</b>
	B. Stormwater Issues	<b>24</b>
	C. Stormwater Regulations	<b>25</b>
<b>VII</b>	<b>Floor Cleaning</b>	<b>26</b>
	A. Routine Maintenance	<b>26</b>
	B. Mop Water Disposal Options	<b>26</b>
	C. Spills—Absorbent Waste Disposal	<b>27</b>
<b>VIII</b>	<b>Health Concerns</b>	<b>28</b>
<b>IX</b>	<b>Appendixes</b>	<b>30</b>
	A. Glossary	<b>30</b>
	B. Pollution Prevention Opportunities List	<b>31</b>
	C. Vendor Directory	<b>34</b>
	D. Interim Used Oil Policy	<b>37</b>
	E. Map of Air Pollution Control Authorities	<b>39</b>
	F. Treatment by Generator	<b>41</b>
	G. Resources	<b>50</b>
	H. Bibliography	<b>51</b>

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James DeMay

# Executive Summary

In 1999, the Washington State Department of Ecology's Hazardous Waste and Toxics Reduction Program conducted a technical assistance project for the metal machining industry sector. This report serves to provide this technical and regulatory information to the industry sector as a whole. The report is based on research by the sector team and on site visits to 12 metal machining facilities in Spring 1999.

The scope of the project included:

- Researching the environmental and regulatory issues in this industry sector.
- Conducting site visits at a cross-section of metal machining facilities.
- Evaluating current industry pollution prevention (P2) practices to identify technical assistance needs.
- Highlighting the most significant P2 opportunities and providing resources for future P2 actions.

The site visits revealed that a significant amount of pollution prevention is already being achieved at metal machining facilities. Common P2 practices include fluid monitoring, sump maintenance, and draining metal chips to recover fluids. The report highlights recommended additional P2 practices. These recommendations include using way oil that easily separates from metal working fluid, using centralized recycling stations, and using high quality coolants to increase fluid life span.

The report also discusses the compliance issues involved with the disposal of waste metal working fluid. The key issues are the designation of spent metal working fluids as either used oil or dangerous waste and the management requirements for these wastestreams. The Department of Ecology is in the process of adopting new used oil regulations, which will change this designation process. These proposed changes are discussed in the report.

This document summarizes the Metal Machining Sector Project's findings as well as recommendations, information and resources for metal workers.

# Overview

Since 1995, Department of Ecology (Ecology) has conducted sector projects with the electroplating, fiberglass, printed circuit board manufacturing, national security, and paint manufacturing industries. In 1999, the metal machining sector project was selected because the industry placed high on the ranking list due to hazardous waste generation, Toxic Release Inventory (TRI) emissions, and the number of facilities that prepare pollution prevention plans.

Sector projects are short-term projects that focus on a particular industry type. These projects provide Washington businesses with statewide industry-specific pollution prevention (P2) assessments and technical assistance. This is achieved through a two step process. First, information is collected through research and site visits; the data is then combined and analyzed. Secondly, Ecology distributes the results to businesses within the sector. Sector projects are multi-media (i.e. air, water and land) and cover the environmental issues pertaining to the industry sector.

Currently, other agencies are conducting parallel work with this industry sector. King County is working on technical assistance for this sector, including site visits to all small and medium quantity hazardous waste generators in the county. In addition, Labor & Industry has done substantial work with health concerns with this industry (See Health Section).

Of the various processes associated with metal fabrication, metal machining was selected as the primary focus of this project. The metal machining industry comprises facilities that shape a vast array of metal products, from airplane spars to nuts and bolts. A wide variety of shaping techniques are used, including drilling, boring, milling, broaching, grinding, and turning. The main wastestreams from these processes are metal working fluids, used oil, cleaning wastes, metal chips and grinding swarf (metal residue from grinding).

*Pollution Prevention (P2) is any practice that reduces, avoids, or eliminates the generation of wastes or the toxicity of wastes, prior to generation, without creating substantial new risks to human health or the environment.*

## Site Visits

Department of Ecology conducted 12 site visits to metal machining facilities during the months of February and March, 1999. The purpose of these visits was to:

1. Assess the current pollution prevention activity level
2. Identify new pollution prevention opportunities
3. Ascertain other important issues relating to this industry category including compliance issues
4. Identify additional research needs

**Table 1: Site Visits**

Facility Name	Location	Type of Products
AllFab Aerospace	Everett	Aerospace
Boeing Corporation - Plant 2	Tukwila	Aerospace
Exotics Metals Forming Co.	Kent	Aerospace
Fatigue Technology	Tukwila	Metal Fatigue Reduction
Gear Works	Seattle	Gear Manufacture
Hansen Machine Corporation	Auburn	Aerospace
Hexcel Structures	Kent	Aerospace components
Jorgenson Forge	Seattle	Destroyer Shafts
Modine Western	Seattle	Radiator parts
Pioneer Industries	Seattle	Aerospace
Precision Machine Company	Tacoma	Aerospace
Precor	Woodinville	Health/Exercise Equipment

# Pollution Prevention Summary

The following is a summary of the key pollution prevention practices that are discussed in further detail in the chapters of this report. The purpose of this summary is:

- To identify baseline pollution prevention (P2) practices that should be common to every facility.
- To identify 10 additional P2 practices that are highly recommended by Ecology.

These practices are presented in two separate lists, with the baseline practices presented first. See the appendix for a full listing of P2 practices for metal machining facilities.

## Baseline Pollution Prevention

The following is a list of basic P2 practices that, in Ecology's view, should already be taking place in every metal machine shop due to their basic nature and ease of implementation.

### List I: Baseline P2 Practices

#### Metal Working Fluid Testing

1. Monitor Concentration:  
Keeping the concentration of the metal working fluid (MWF) in the correct range will ensure that only the right amount of concentrate is used. It will also help control any gumming, sticking or smearing left on workpieces due to excess concentrate. Refractometry and titration are the most common techniques for measuring fluid concentration.

#### Sump Maintenance

2. Sump and Trench Maintenance:  
Periodically cleaning out the MWF sumps and trenches will keep them free of solid matter that can hamper fluid flow. Solid materials provide excellent areas for microbe growth and may clog up MWF lines. Disinfect sumps and trenches when MFW fluid is removed.

Disinfectant options include alcohol or steam cleaning. Without the disinfecting step, new MWF fluid will be inoculated with leftover bacteria when it is added to the sump.

#### Metal Working Fluid Maintenance Plan

3. Daily Inspections:  
Conducting daily inspections of each machine will help identify problems and trends, and speed up machine repair through early identification of problems. This contributes to less downtime and less fluid waste.

#### Recycling Systems

4. Tramp Oil Skimmers:  
These come in several different types including rope, belt and disk skimmers. Skimmers remove the oil that makes its way into the MWF and floats on the surface of the fluid. Oil removal helps keep the fluid aerated with dissolved oxygen, and reduces the food source for microorganisms.

#### Chip Management

5. Chip Filters:  
Filters keep the chips and grit created in the machining process from contaminating the MWF sump. The high amount of surface area created by the chips provides an excellent area for microbe growth. Thus, filtering helps to lower the bacteria count.
6. Drain Metal Chips to Recover Fluid:  
One way of draining metal chips is to place them into a perforated container with a catch basin and reuse the collected metal working fluid. Another option is to manually shut off the chip conveyor for a period of time and allow the fluids to drain back into the machine sump. A chip wringer or centrifuge can be used to get even more fluid from the chips. These processes also create higher quality chips for recycling.

## Recommended Additional P2 Practices

7. **Recycle the Metal Chips and Scrap:**  
Many, but not all, metal recyclers will take chips. They will usually require chips to be segregated by metal type and free of oil. A higher price can usually be obtained if chips are compressed into briquettes through the use of a briquetting machine.

### Spills

8. **Pumps, Spigots, and Funnels:**  
Using pumps, spigots and funnels when transferring MWF will reduce the amount of lost fluid and the risk of spilling fluids.

### Other

9. **Fix Leaking Seals and Gaskets:**  
This keeps the fluid where it belongs, instead of on the floor or all over the machine and operator. Even small leaks can waste a surprising amount of fluid over time.
10. **Tramp Oil Separation:**  
Tramp oils and MWF should be thoroughly separated before skimming the tramp oils off the top. This will reduce the amount of MWF that is wasted with the removal of the tramp oil.

The following is a list of pollution prevention practices that Ecology's Metal Machining Sector Team highly recommends to all facilities. These practices are recommended because, in general, companies that are already using them are enjoying cost-savings and decreased waste generation.

## List II: Recommended P2 Practices

### Metal Working Fluid Maintenance Plan

1. **Keep a Log of Monitoring Data:**  
Keeping a log of fluid characteristics, such as pH and concentration, will help identify trends, solve problems, and keep the fluid in the proper condition.
2. **Operator Responsibility:**  
The maintenance of metal working fluids (MWF) should be limited to only one person or a team of people who are trained and knowledgeable about fluid maintenance. This will reduce fluid property variances and help cut down on the overuse of MFWs.

### Metal Working Fluid Selection

3. **Use High Quality MWFs to Get the Longest Life:**  
The use of high quality MWFs is recommended because these fluids are more resistant to biological attack and additive breakdown. This resistance allows them to be used many times without a loss of performance.
4. **Look at the Compatibility of Way Oils and MWFs:**  
Ensuring that way lubricants and MWFs easily separate will help in the treatment and recycling process. Select a way oil that does not cause foaming problems or impair the separation characteristics of the two fluids. High-grade way oils typically separate easily from MWF. In addition, they contain little or no sulfur compounds that are a food source for bacteria.



5. Use Chlorine Free MWFs:

Chlorine has a large impact on waste designation and thus effects disposal costs, management options, and management requirements. The proposed regulations, if adopted, will prohibit waste MWF formulated with chlorinated compounds from being designated as used oil.

## **Sump Maintenance**

6. Cover Sumps:

By covering the MWF sumps in machines, airborne microorganisms are kept out of the fluid. This is important because a large number of the microbes that contaminate fluids are airborne. Covers also keep out trash such as dust, cigarette butts and food.

## **Recycling Systems**

7. Aerate/Ozonate the MWF to Keep the Dissolved Oxygen Level Up:

By aerating the MWF or using an ozone generator to bubble oxygen through the fluid, the anaerobic microbe count will be kept low. Dissolved oxygen in the water keeps anaerobic bacteria from growing and creating the “Monday morning stink.” MWF treated with dissolved ozone reduces the microbe count. Ozone is highly toxic to microbes and kills them.

8. Central Recycling Systems:

Central recycling systems allow a large volume of fluid to be treated at once. Small, wheeled versions (about the size of a large shopping cart) are available. A good recycling system includes a settling tank, oil skimmer, coalescer, and an aeration device.

## **Spills**

9. Reuse Absorbent Pads:

Using absorbent pads that can be wrung out and reused will cut down on the amount of absorbent material that must be discarded as hazardous waste, and save money in fresh absorbent and waste handling costs. Another option is to dedicate a mop for the clean up of oily spills.

## **Other**

10. Use Distilled or Deionized Water:

Using distilled or deionized water keeps dissolved minerals out of the MWF. These contaminants can build up in the fluid as the water in the fluid evaporates, causing separation of the concentrate from the water.

# Metal Working Fluid Maintenance

In the early 1970's, metal working fluids (MWFs) were designed for a relatively short life span prior to disposal. Since then, the cost for fluid disposal has rapidly increased, along with liability concerns and regulations. As a result, a growing importance has been placed on fluid maintenance.

The key element of maintaining an efficient metal working fluid system is a fluid maintenance program. No matter what type of fluid you use, the life of the fluid can be extended through the use of a maintenance program.

The goal of a MWF maintenance program is to optimize fluid performance, reduce oily wastewater volume, and reduce fluid concentrate and disposal costs. Contaminated and spoiled fluids are the largest source of waste from machining operations. An established maintenance program allows corrective actions to be taken before fluids become rancid.

A written maintenance plan should be created to document your MWF maintenance program. This plan should include the following elements:

**Table 2: Key Elements of a Fluid Maintenance Plan**

Operator responsibilities	List all the employees that implement the maintenance plan and their responsibilities.
Monitoring / Fluid testing	<p>Fluids can be monitored to predict or anticipate problems. Physical characteristics such as product concentration, pH, fluid odor, and color are good indicators of fluid degradation. Examples:</p> <p>Product concentration can be measured by using a refractometer or by titration.</p> <p>The pH of the fluid can easily be measured with litmus paper or a pH meter. If the pH of a fluid in a sump falls below 8.5, the fluid loses efficiency, is prone to rusting, and biological activity will increase significantly.</p>
Data tracking system	Keep a log of observations and test data.
Sump change out criteria	<p>Setting criteria for change out reduces unnecessary disposal of MWF fluid and creates a standard for fluid reuse.</p> <p>Examples: odor, appearance (milky appearance is normal), length of use, pH (usually between 8.5 – 9.4 is normal), residue or film left on parts.</p>
Change-out procedures	Document how to handle and process the fluid through your recycling system.
Sump cleaning	The purpose is to remove biological growth in the sump. Regular cleaning reduces health risks and improves fluid life. Examples: steam cleaning or use of a disinfectant solution.
Removal of chips	Regular removal of chips reduces the habitat for biological organisms in your sumps.
Training program	The written maintenance plan should be used to educate employees about MWF management and is an excellent source of training material for new employees.

## Selection Criteria

Selecting which metal working fluid (MWF) to use is a very important decision with many considerations. Some of the main factors to consider are lubricity, cooling properties, rust protection, metal type, toolbit type, fluid life, and disposal costs. For more examples of selection criteria and information about metal working fluids, see “Metalworking Fluids” by Jerry P. Byers or “Lubricants and Lubrication in Metalworking Operations” by Eliot S. Nachtman and Serope Kalpakjian.

One factor that often gets overlooked is the separation characteristics between way oils and metal working fluids. It is very important to select a way oil that easily separates from the MWF. Way oils that are not separated from the metal working fluid promote the degradation of the fluid’s properties and thus reduce the life span of the fluid. Furthermore, the better the separation of these two fluids, the easier it is to treat and/or recycle the metal working fluid.

High-grade way oils are a good choice because they separate easily and contain very little sulfur, which serves as a food source for microbes.

Another important element to consider when selecting a metal working fluid is whether or not it is chlorinated (e.g. contains chlorinated paraffins) or non-chlorinated. Chlorine has a large impact on waste designation and thus effects disposal costs, management options, and management requirements (See section - Spent Metal Working Fluid Disposal). Chlorinated metal working fluids should only be selected when high-pressure or high-speed conditions are critical to the machining operation.

A final consideration is whether one type of metal working fluid can be used for the entire facility. Having only one fluid simplifies the maintenance and treatment of the fluid, requiring a facility to operate only one recycling system.

**Table 3: Types of Metal Working Fluids**

<b>Fluid Type</b>	<b>Composition</b>	<b>Advantages</b>	<b>Disadvantages</b>
Straight oils	Fluids that consist of solvent-refined or hydro-treated petroleum oil or other oils of animal or vegetable origin.	Resistant to biological degradation. Good rust protection. Very little maintenance required.	Higher cost, difficult to clean, fire hazard and health hazard.
Water soluble oils	Fluids that contain approximately 50%- 90% water, with refined base oil and emulsifiers to mix the oil and water. Other additives commonly found in soluble oils are biocides, soaps, softening agents, and rust inhibitors.	Good cooling capacity and lubricity.	Tramp oil removal required. A maintenance program to minimize bacterial growth is necessary.
Semi-synthetic fluids	Synthetic fluids that contain small amount of refined base oil (5 –20%) that is micro-emulsified, water and a solution of additives. These fluids tend to be similar to soluble oils.	Good cooling capacity. Average lubricity. Longer sump life.	Difficult to treat. May emulsify tramp oil. High foaming potential.
Synthetic fluids	Aqueous solutions that do not contain refined oil. Similar additives as seen in semi-synthetic fluids.	Excellent cooling properties. Longer sump life. Good rust protection. Clear fluid allows workpiece to be visible	Poor lubrication and difficult to treat.

**Table 3: Types of Metal Working Fluids(continued)**

Fluid Type	Composition
High pressure additives	High pressure additives found in MWFs are chlorine, sulfur and phosphorus compounds. These compounds are sometimes referred to as EP (extreme pressure) agents, and are most commonly found as halogenated organic compounds (e.g. chlorinated paraffins). Halogenated EP fluids should not be used unless they are critical to the operation. In addition, sulfur and phosphorus are a food source for microbes and sulfur can stain metals. If you use any fluids with these compounds, remember to recycle and reuse them as much as possible.

## Metalworking Fluid Recycling

A good fluid recycling system extends the useful life of metalworking fluids (MWFs) and has both economic and environmental advantages such as:

- Improving product quality.
- Decreasing the amount of new fluids purchased.
- Decreasing costs of disposal for spent fluids.
- Decreasing downtime for machine clean outs and recharges.

Recycling systems remove contaminants such as tramp oil, dirt, and bacteria; and readjust the fluid concentration before the fluid is returned to an individual sump. There are two classes of recycling systems, central recycling systems and individual recycling systems.

### Central Recycling System (including portable systems)

A central system is a large reservoir that supplies fluid to several individual machines. The major advantage of a centralized system is that contaminants (solids, oil, and bacteria) can be controlled at one location. This eliminates the need for many different systems on each machine, which overall will reduce the time needed to monitor and maintain the fluids. With proper fluid controls and management techniques, the typical fluid in a central system can have a life of one to three years (or even longer). Table 4 is a list of the types of contaminant removal equipment used in central systems.

Portable recycling systems are a cost-effective alternative to centralized recycling systems. The fluid from an individual sump is pumped into a portable unit that removes contaminants. The fluid is then returned to the sump and the portable system is moved to the next machine. If the fluid from each machine is treated according to a prescribed maintenance schedule, daily fluid monitoring may not be required.

**Table 4: Central Recycling Systems**

	Removes:		
	Oil	Dirt/Metal Chips	Bacteria
Settling/ Dragout		X	
Flotation	X	X	
Positive Filters			
Gravity		X	
Pressure		X	
Vacuum		X	
Centrifuge	X	X	
Oil Skimmer	X		
Coalescer	X	X	
Pasteurization			X

*Byers, Jerry P. (editor), Metal Working Fluids, Marcel Dekker, Inc., NY,NY, 1994, page 346.*

## Individual Recycling Systems

Unlike central recycling systems, individual recycling systems tend to control only one type of contaminant. For example, a milling machine might only have a skimmer to remove any excess tramp oil. The benefits of using individual systems are their low capital costs, and ability to focus on one particular problem for a given machine.

There is a wide variety of recycling systems for individual machines. Table 5 lists some of the more commonly used recycling systems for individual machines.

**Table 5: Individual Machine Recycling Systems**

	Removes:		
	Oil	Dirt/Metal	Bacteria
<b>MEDIA-BASED SYSTEMS</b>			
Filtration		X	
Pressure		X	
Vacuum		X	
Gravity		X	
<b>NATURAL FORCE SYSTEMS</b>			
Settling/Gravity		X	
Oil Skimmers	X		
Coalescers	X	X	
Flotation/Aeration	X		
<b>MECHANICAL SEPARATION SYSTEMS</b>			
Centrifuges	X	X	
<b>OTHER</b>			
Pasteurization			X
Ozonation			X

*Byers, Jerry P. (editor), Metal Working Fluids, Marcel Dekker, Inc., NY,NY, 1994, page 347.*

Table 6 on the following pages describes the recycling/maintenance components listed in the two previous tables and also identifies possible benefits for each.

The following are some possible combinations for portable, individual, and central batch recycling systems.

- A combination of settling tank, skimmers, and aeration devices will remove coarse particles by settling and fine particles and tramp oil by skimming.
- A high efficiency sump cleaner will remove fluids and solids from sumps. The fluid is passed through a central batch-recycling unit utilizing a coalescer, pasteurization, and filtration technique and then returned to the sump. Other central batch combinations include: skimmers/filtration/ozonators; skimmers/coalescer; skimmer/fluid concentration adjuster.
- A portable unit equipped with a skimmer and ozonator for treating individual sumps.
- A portable unit equipped with a coalescer, filter, and fluid concentration adjuster.
- Portable sump cleaner, or “brown cow”, is used to transfer used fluid to a 3 stage separation tank. Particulate settles out and tramp oil is skimmed off in the first 2 stages. “Clean Cows” are used to return treated fluid to individual sumps.
- Portable units that act only as filtration units.
- A settling tank, ozonation/aeration, tramp oil skimmer and a filter.

**Table 6: General Descriptions of Common Recycling Components and Considerations**

Equipment	Description	Considerations
Settling/Dragnet	Particulates in many metal working fluid systems are often adequately removed by installation of a simple gravity/settling tank. Such a tank is enhanced when an automatic bar, rake device, or conveyor belt system is added to remove metal shavings and other settled solids. A device that uses aeration to float solids and tramp oil to the surface.	Advantages include no media replacement or disposal required. One disadvantage is that clarity is dependent on retention time and chip weight. Also, this system is not effective with aluminum chips or swarf which tend to float.
Flotation/Aeration	Advantages include no media replacement or disposal required. It works on fine particles. Disadvantages include greater floor space requirements and increased usage of plant compressed air.	
Positive Filters		
Gravity Filters	Because of gravity, the weight of the metalworking fluid is sufficient to provide the force required to penetrate the filter medium. Most common filter media are cloth, paper, organic, polymers, or wire screens. A device that contains two horizontal compartments; a movable top compartment and stationary bottom compartment. During operation, air pressure seals the two compartments together. The filter medium may be a continuous nylon belt used as is or one coated with a disposable medium. The common positive filter system is driven by a vacuum. Fluid is pulled by vacuum through a permanent roll or cylinder.	Advantages include low cost and ease of operation. Disadvantages include greater floor space requirements and increased media disposal.
Pressure Filters		Advantages include ability to remove small particles efficiently. Also, large volumes can be handled within minimal floor space. Disadvantages include prematurely plugged filters if tramp oil is not removed first.
Vacuum Filters		Advantages include low capital costs, efficient filtration, and no media replacement or disposal required. Disadvantages include greater floor space requirements.

Centrifuge	<p>A rotating bowl that uses centrifugal forces to separate oil, water, and solids. Low-speed centrifuges remove suspended solids from most liquids. High-speed units both remove tramp oils and solids. The goal is to separate free tramp oil and loosely emulsified oil (such as mechanically emulsified oil.)</p> <p><u>Chip Wringers</u>, a variation, separate chips from cutting fluids by alternating high to low-speed cycles.</p>	<p>Advantages include high throughput rate (about 2 gpm) and good suspended solid and tramp oil separation. Disadvantages include high maintenance when solids and grease require frequent cleaning and separation of product components.</p>
Coalescer	<p>Uses the property of oil attraction to polypropylene media (or oleophilic, "oil-loving" materials) for removal of tramp oil.</p>	<p>Advantages include its applicability to either central or portable systems. Coalescers are not effective for removing water-miscible hydraulic oils or emulsified lubricating oils, however.</p>
Pasteurization	<p>A heating process that improves separation of solids and reduce biological growth.</p>	<p>Under certain conditions, this process successfully controls microbial growth. This process can reduce a fluid's lubricity and corrosion inhibition properties.</p>
Filtration	<p>Fluid is passed through a disposable filter to remove solid particles</p>	<p>Filtration units enhance part finish, tool life, bacteria control, and lubricity properties. They are most advantageous when used with central recycling systems or portable recycling units. Units on individual machines tend to be labor intensive.</p>
Oil Skimmers	<p>Devices that skim tramp oil from fluid reservoirs in machine sumps. The most common are belt and disc skimmers.</p>	<p>For individual systems, a combination of settling tank and skimmers will remove coarse particles and tramp oil. This relatively inexpensive combination often provides sufficient clean lubricant ready for reuse.</p>

# Spent Metal Working Fluid Disposal

Once a metal working fluid (MWF) is determined to be no longer usable, it must be designated and disposed accordingly. This section of the report discusses:

- Designating spent MWF as either used oil or dangerous waste under existing regulations.
- Designation changes under proposed new regulations.
- Management requirements for used oil and dangerous waste.
- Evaporator requirements.

## Designation of Spent MWF under the Existing Dangerous Waste Regulations

The first step in designating spent metal working fluid is to determine whether it is used oil or dangerous waste. A series of questions must be answered in order to make this determination. The following seven steps and the flowchart on page 15 explain how this determination is made.

In order to use the flowchart, a business needs to determine the total halogen content of their spent metal working fluid, preferably by sending a sample out to a laboratory for testing. If chlor-detects or “sniff” tests are used instead, businesses should keep a written record of the name and telephone number of the person performing the test along with the sampling date and equipment calibration date. All written test records should be kept onsite for 3 years.

**Note:** Not all MWFs are formulated from crude oil or synthetic oil, and therefore do not meet the definition of used oil.

### Step 1: Is the spent MWF to be re-refined into oil/MWF?

Spent metal working fluid that will be re-refined into oil or reformulated into metal working fluid is not dangerous waste and is not subject to dangerous waste designation or management requirements (reference WAC 173-303-120(2)). Spent MWF to be re-refined is managed as used oil and is subject only to WAC 173-303-050, 120(b), 145, 515 and 960. These sections require that the fluids be managed in a manner that does not pose a threat to human health or the environment.

**Note:** Not all metal working fluids can be re-refined. Some contain metals, such as copper, zinc, or lead, which interferes with the refining process. Consult with your vendor for further information.

### Step 2: Is the MWF formulated with chlorinated compounds?

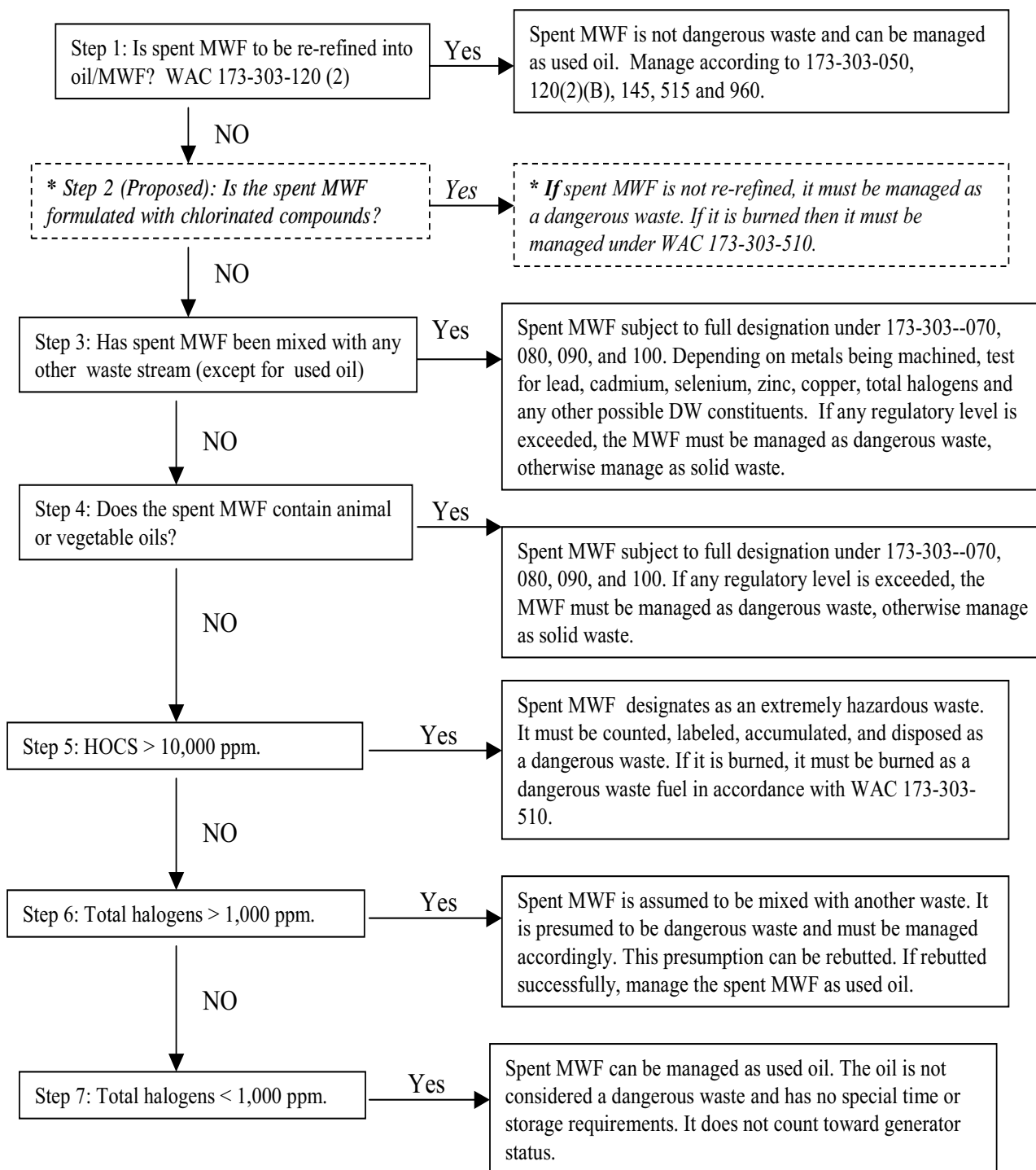
This step is the *proposed change* to the metal working fluid designation process that Ecology may adopt under the new used oil rules. This issue is discussed below in the section, “Designation of Spent MWF under Proposed New Regulations.”

### Step 3: Has the spent MWF been mixed with other wastestreams?

If spent MWF is mixed with another wastestream (such as mop water), the resultant mixture becomes subject to the designation process under WAC 173-303-070, -080, -090 and -100. It is illegal to mix dangerous waste with non-dangerous wastestreams. A large number of dangerous waste constituents can be found in spent MWF, including lead, cadmium,



## Flow Chart: Spent Metal Working Fluid (MWF) Designation Process



\* This step is the proposed change to the metal working fluid designation process that Ecology may adopt under the new used oil rules.

chromium, selenium, copper and zinc. These metals typically enter the MWF via the machining process. For example, when zinc plated or zinc bearing metals such as brass are machined, zinc, copper and lead can be present. It is necessary to use process knowledge and material safety data sheets (MSDS) to develop a complete list of elements and compounds to test for.

Businesses can avoid the problems associated with mixed wastestreams by training employees to separate wastestreams, properly labeling waste containers and restricting container access to trained employees.

#### **Step 4: Does the MWF contain animal or vegetable oils?**

“Used oil means any oil that has been refined from crude oil, or any synthetic oil, that has been used and, as a result of such use, is contaminated by physical or chemical impurities” (WAC 173-303-040). This definition excludes animal and vegetable oils (lard, canola, etc.). Spent MWF’s that contain animal or vegetable oils do not meet the definition of used oil and therefore are subject to designation under WAC 173-303 (see previous paragraph for common waste constituents to test for).

#### **Step 5: Does the spent MWF have > 10,000 parts per million (ppm) halogenated organic compounds (HOC)?**

Metal working fluid with more than 10,000 parts per million HOC is considered extremely hazardous waste. If it is burned, it must be managed as dangerous waste fuel under WAC 173-303-510. However, water-soluble MWFs typically contain less than 10,000 ppm HOC’s unless they are evaporated or mixed with other halogenated wastestreams (e.g. chlorinated compounds). Evaporator residues from chlorinated MWFs will typically exceed the 10,000 ppm HOC limit.

WAC 173-303-100 states that wastestreams that have more than 10,000 ppm polycyclic aromatic hydrocarbons (PAH) must be managed as extreme hazardous waste. Most MWF’s have not had significant PAH concentrations in their formulations for many years.

#### **Step 6: Does the MWF have >1,000 ppm total halogens?**

Metal working fluid that contains more than 1,000 ppm total halogens is presumed to have been mixed with a dangerous waste and is required to be managed as dangerous waste. However, the presumption that mixing has occurred can be rebutted. In order to rebut this presumption, the business must demonstrate that the MWF does not contain halogenated dangerous waste constituents as a result of intentional mixing. The halogenated dangerous waste constituents are listed in WAC 173-303-9903 and -9904.

Rebutting the presumption that dangerous waste has been mixed into MWF can be as simple as:

- ✓ Demonstrating via a material safety data sheet that the source of the halogens is the metal working fluid itself (soluble MWF’s typically contain chlorinated paraffins) **AND:**
- ✓ Demonstrating that care is taken to avoid using products that introduce chemicals listed in WAC 173-303-9903 and -9904 into the MWF **AND:**
- ✓ Demonstrating that other wastestreams are managed so as to prevent mixing.

#### **Step 7: Does the MWF have < 1,000 ppm total halogens?**

If the spent MWF contains less than 1,000 ppm total halogens it can be managed as used oil. See section below on “Managing Spent MFW as Used Oil”.

## Designation of Spent MWF under Proposed New Regulations

The Department of Ecology is in the process of adopting the Federal Used Oil Management Standards (UOMS), with final adoption anticipated in 2000.

### What will change?

One of the proposed changes to the rule affects spent soluble metal working fluids (MWFs) that are formulated with chlorinated paraffins (see Step 2 above). Under the proposed rule, spent MWFs formulated with chlorinated paraffins can be managed as used oil, **only** if they are sent to be re-refined. Otherwise, these spent MWFs must be managed as dangerous waste. Furthermore, spent metal working fluids that designate as dangerous waste and are sent to be burned, must be managed under “Special Requirements for Dangerous Wastes Burned for Energy Recovery” (WAC 173-303-510). The purpose of this rule change is to eliminate the potential for spent chlorinated MWFs to be burned in inappropriate combustion units, which may generate dioxins.

Note that the terms “chlorinated paraffins” and “chlorinated alkanes” are synonymous and are used interchangeably on material safety data sheets (MSDS). Also note that some chlorinated paraffins are not required to be listed on MSDS sheets but still might be present in MWFs. See Appendix G (Resources) for help using MSDS sheets in determining whether the fluid is formulated with chlorinated compounds.

## Managing Spent MWF as Dangerous Waste

To properly manage dangerous waste, businesses need to determine their generator status. Generator status depends on the total amount of dangerous waste generated per month and the amount of waste stored on site. Management requirements differ depending on generator status. The following reference guide outlines the management requirements based on generator size.

**Table 7: Guide for Dangerous Waste Generators in WA**



Quick Reference Guide

***Guide for Dangerous Waste (DW) Generators in Washington***

<b>Dangerous Waste Regulations</b>			
	<b>Large Quantity Generator (LQG)</b> Generates >2,200 lbs/mo	<b>Medium Quantity Generator (MQG)</b> Generates 220-2,200 lbs/mo	<b>Small Quantity Generator (SQG)</b> Generates <220 lbs/mo or <2.2 lbs/mo Acute Hazardous Waste (AHW) or WTO1 (EHW)
<b>Dangerous Waste Designation</b>	Determine if Waste is Covered by Regulations. WAC 173-303- 070-100, 170(1)	Determine if Waste is Covered by Regulations. WAC 173-303- 070-100, 170(1)	Determine if Waste is Covered by Regulations. WAC 173-303- 070(8), 070-100, 170(1)
<b>Identification Number &amp; Required Notices</b>	File Form 2 to Notify & Obtain ID#. WAC 173-303- 060, 170	File Form 2 to Notify & Obtain ID#. WAC 173-303- 060, 170	Not Required. WAC 173-303- 070(8), 170(1)
<b>Labeling, Marking of Waste During Accumulation</b>	DW Label w/ Start Date, Risk Label (major risks to employees, emergency personnel & public). WAC 173-303- 200(1)(c),(1)(d)	DW Label/Date, Risk Label. WAC 173-303- 200(1)(c),(1)(d)	Not Required by DW Regulations but Major Risk Label Required by OSHA/WISHA. WAC 173-303- 070(8)
<b>Waste Generation Amount</b>	More than 2,200 lbs/mo.	Between 220 lbs/mo and 2,200 lbs/mo.	Less than 220 lbs/mo or less than 2.2lb/mo Acute Hazardous Waste (AHW) or WTO1 (EHW).
<b>Waste Accumulation Amount</b>	No Volume Limit. WAC 173-303- 200(1)	2,200 lbs (LQG requirements apply above 2,200). WAC 173-303- 201(1), (2)	Not to Exceed a total of 2,200 lbs. WAC 173-303- 070(8)(a)
<b>Accumulation Time Limit</b>	90 days. WAC 173-303- 200	180 days. WAC 173-303- 201(2)(a)	No Limit. WAC 173-303- 070(8)
<b>Satellite Accumulation Areas</b>	55 gals or 1 qt. Acutely Hazardous Waste (AHW). WAC 173-303- 200(2)(c)	55 gals or 1 qt. AHW. WAC 173-303- 200(2)(b)	Not to Exceed Quantity Exclusion Limit (QEL). WAC 173-303- 070(8)(a)
<b>Accumulation Area Inspections</b>	Must be Scheduled, Documented, Corrections. WAC 173-303- 200(1)(e), 320(1),(2)(a),(b),(d),(3)	Must be Scheduled, Documented, Corrections. WAC 173-303- 201(2), 200(1)(e), 320(1),(2)(a),(b),(d),(3)	Not Required. WAC 173-303- 070(8)
<b>Personnel Training</b>	Required Written Plan. WAC 173-303- 200(1)(e), 330	Not Required by 201(2)(b), but Required by OSHA/WISHA. Also See Cont. Plan & Emergency Procedures Below. WAC 173-303- 201(2)(b)	Not Required by DW Regulation, but Required by OSHA/WISHA. WAC 173-303- 070(8)
<b>Preparedness and Prevention</b>	<ul style="list-style-type: none"> <li>Minimize Fire, Explosion, Release.</li> <li>Communication Systems (Internal &amp; External), Fire Control.</li> <li>Test/Maintain Communication &amp; Control Equipment.</li> <li>Access to Communications or Alarm System.</li> <li>Adequate Aisle Space.</li> <li>Arrangements with Local Authorities.</li> </ul> WAC 173-303- 200(1)(e), 340	<ul style="list-style-type: none"> <li>Minimize Fire, Explosion, Release.</li> <li>Communication Systems (Internal &amp; External), Fire Control.</li> <li>Test/Maintain Communication &amp; Control Equipment.</li> <li>Access to Communications or Alarm System.</li> <li>Adequate Aisle Space.</li> <li>Arrangements with Local Authorities.</li> </ul> WAC 173-303- 201(2), 200(1)(e), 340	Not Required. WAC 173-303- 070(8)

	LQG Cont'd	MQG Cont'd	SQG Cont'd
<b>Contingency Plan &amp; Emergency Procedures</b>	<ul style="list-style-type: none"> <li>Written Plan.</li> <li>Arrangements with Local Emergency Response Agencies (ER).</li> <li>Emergency Coordinator (EC) (phone, address).</li> <li>Emergency Equipment List.</li> <li>Evacuation Plan.</li> <li>Plan distribution to police, fire depts., hospitals &amp; local agencies.</li> <li>Plan must be amended if it fails in an emergency or there are changes in the facility, equipment or personnel.</li> <li>EC must respond.</li> </ul> WAC 173-303- 200(1)(e), 350, 360	<ul style="list-style-type: none"> <li>Emergency Coordinator (EC) Onsite/On Call.</li> <li>Post: Location of EC Phone.</li> <li>Post: Location of Fire Extg./Spill Control/Fire Alarm.</li> <li>Post: Fire Dept. Phone.</li> <li>Familiarize Employees with Plan &amp; Emergency Procedures.</li> <li>EC Must Respond.</li> </ul> WAC 173-303- 201(2)(c)	<p>Not Required. Check OSHA/WISHA Requirements.</p> <p>WAC 173-303- 070(8)</p>
<b>Additional Reporting for Emergencies</b>	<p>Report Spill, Fire, Explosion, Release.</p> <p>WAC 173-303- 145, 200(1)(e), 360</p>	<p>Report Spill, Fire, Explosion, Release.</p> <p>WAC 173-303- 145, 201(2)(c)(iv)</p>	<p>Report Spills if Threat to Human Health &amp; the Environment.</p> <p>WAC 173-303- 070(8)(b)(ii)</p>
<b>Waste Containers</b>	<ul style="list-style-type: none"> <li>Good Condition.</li> <li>Nonleaking.</li> <li>Compatible with Waste.</li> <li>Closed/Protected.</li> <li>30" Aisle Space.</li> <li>Response to Spills, Leaks, Emergencies.</li> <li>Weekly Inspections.</li> <li>Ignitable, Reactive, Incompatible Waste.</li> </ul> WAC 173-303- 200(1)(b), 630(2),(3),(4),(5),(6),(8),(9),(10)	<ul style="list-style-type: none"> <li>Good Condition.</li> <li>Nonleaking.</li> <li>Compatible with Waste.</li> <li>Closed/Protected.</li> <li>30" Aisle Space.</li> <li>Response to Spills, Leaks, Emergencies.</li> <li>Weekly Inspections.</li> <li>Ignitable, Reactive, Incompatible Waste.</li> </ul> WAC 173-303- 201(2), 200(1)(b), 630(2),(3),(4),(5),(6),(8),(9),(10)	<p>Local Regulations may Apply.</p> <p>WAC 173-303- 070(8)</p>
<b>Waste Tanks</b>	<ul style="list-style-type: none"> <li>Assessment.</li> <li>Design, Installation.</li> <li>Containment, Release Detection.</li> <li>Operating Requirements.</li> <li>Daily Inspections.</li> <li>Response to Spills, Leaks.</li> <li>Closure, Post Closure.</li> <li>Ignitable, Reactive, Incompatible Waste.</li> </ul> WAC 173-303- 200(1)(b), 640 except (8)(a), (8)(c)	<ul style="list-style-type: none"> <li>Operating Requirements.</li> <li>Daily/Weekly Inspections.</li> <li>Closure, Post-Closure.</li> <li>Ignitable, Reactive, Incompatible Waste.</li> <li>Freeboard Requirement.</li> </ul> WAC 173-303- 202	<p>Local Regulations may Apply.</p> <p>WAC 173-303- 070(8)</p>
<b>Disposal of Dangerous Waste</b>	<p>Ship to Permitted TSD or DW Recycler. Uniform Manifest Form Required.</p> <p>WAC 173-303- 200(1)(a)</p>	<p>Ship to Permitted TSD or DW Recycler. Uniform Manifest Form Required.</p> <p>WAC 173-303- 200(1)(a)</p>	<p>Ship offsite or treat onsite: Permitted TSD or Permitted to Manage Mod. Risk Waste or Legitimate Recycle or Other Permitted Solid Waste Facility.</p> <p>WAC 173-303- 070(8)(b)(iii), 802</p>

	LQG Cont'd	MQG Cont'd	SQG Cont'd
<b>Manifest</b>	Use for shipments offsite. WAC 173-303- 180	Use for shipments offsite. WAC 173-303- 180	Not Required - only Bill of Lading. WAC 173-303- 070(8)
<b>Packaging, Labeling, Marking for Transport</b>	Package, Label & Mark per USDOT (49 CFR). WAC 173-303- 190(1),(2),(3)	Package, Label & Mark per USDOT (49 CFR). WAC 173-303- 190(1),(2),(3)	Refer to DOT Regulations. WAC 173-303- 070(8)
<b>Placarding for Transport</b>	Must offer Placard. WAC 173-303- 190(4)	Must offer Placard. WAC 173-303- 190(4)	Refer to DOT Regulations. WAC 173-303- 070(8)
<b>Annual Reporting</b>	File every year. WAC 173-303- 220(1)	File every year. WAC 173-303- 220(1)	File every year, if have ID#. Verification form only. WAC 173-303- 070(8)(b)(iv)
<b>Exception Reporting</b>	45 days: if no signed Manifest from TSD Returned. WAC 173-303- 220(2)	45 days: if no signed Manifest from TSD Returned. WAC 173-303- 220(2)	Not Required. WAC 173-303- 070(8)
<b>Recordkeeping</b>	3 years: Manifests. 5 years: Annual Reports, Exception Reports, Test Results. WAC 173-303- 210(2),(3)(a)	3 years: Manifests. 5 years: Annual Reports, Exception Reports, Test Results. WAC 173-303- 210(2),(3)(a)	Not Required but encouraged. WAC 173-303- 070(8)
<b>Waste Minimization</b>	<ul style="list-style-type: none"> <li>For generators &gt;2,640 lbs/yr: Plan to minimize waste required.</li> <li>Certify on manifest: Written plan and program in place to minimize hazardous waste volume, toxicity.</li> <li>Submit Executive Summary to WDOE.</li> <li>5 year updates.</li> </ul> WAC 173-307	Certify on Manifest: good faith effort to minimize waste and selected best waste management method. <ul style="list-style-type: none"> <li>For generators &gt;2,640 lbs/yr: Plan to minimize waste required.</li> <li>Submit Executive Summary to WDOE.</li> <li>5 year updates.</li> </ul> WAC 173-307	Not Required.
<b>Recycled, Reclaimed, Recovered Waste</b>	<ul style="list-style-type: none"> <li>Depending on circumstances, Recycled Used Oil, Recycled Used Batteries, other Recycled Wastes partially or fully exempt.</li> </ul> WAC 173-303- 120, 500-530	<ul style="list-style-type: none"> <li>Depending on Circumstances, Recycled Used Oil, Recycled Used Batteries, other Recycled Wastes partially or fully exempt.</li> </ul> WAC 173-303- 120, 500-530	<ul style="list-style-type: none"> <li>Depending on Circumstances, Recycled Used Oil, Recycled Used Batteries, other Recycled Wastes partially or fully exempt.</li> </ul> WAC 173-303- 120, 500-530
<b>Regulating Agency</b>	Ecology.	Ecology.	County/Health District.

While this Quick Reference Guide summarizes the requirements for each generator status under the Dangerous Waste Regulations (Chapter 173-303 WAC), it does not replace them. Always refer to the regulations themselves for more detail or call a hazardous waste specialist at your nearest Ecology Regional Office.

Spokane (509) 456-2926    Bellevue (425) 649-7000  
Lacey (360) 407-6300    Yakima (509) 575-2490

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Ecology Headquarters telecommunications device for the deaf (TDD) number is (360) 407-6006.

## Managing Spent MWF as Used Oil

To determine if a spent metal working fluid meets the definition of used oil see the designation section. For example, some MWFs do not meet the definition of used oil because they are not formulated from crude oil or synthetic oil.

Businesses are required to manage their used oil according to WAC 173-303-050, -145, -515, -960, and -120(2)(b). The following are key aspects of these regulations:

- Businesses must manage used oil in a manner that does not threaten human health or the environment. Businesses are liable for the mismanagement of used oil and are required to report spills that are a threat to human health or the environment.
- Businesses are required to dispose of used oil properly. For example, the use of used oil as dust abatement or to control weeds is considered to be improper disposal.

### Proposed Additional Used Oil Requirements

There are two proposed rule changes that affect businesses that manage spent working MWF as used oil. The first proposed change requires that used oil containers be kept closed except when contents are being added or removed. The second change requires that used oil containers not be opened, handled, managed, or stored in a manner that could cause the container to leak or rupture.

## Evaporator Considerations and Compliance Issues

### Considerations

Businesses that generate spent water-based metal working fluid (MWF) may wish to evaporate water from this wastestream to reduce waste volume and disposal cost. Water-based MWFs include soluble, synthetic or semi-synthetic fluids but not straight oils. These water-based fluids usually contain non-volatile substances and therefore are amenable to evaporation. However, care must be used in building and operating an evaporator to prevent exceeding air quality standards.

Exceeding air quality standards is undesirable due to health concerns as well as the potential worker and/or neighbor complaints that will draw undesired regulatory attention to a facility. Water from spent metal working fluids can be evaporated without evaporating toxic air pollutants by implementing the following six suggestions:

1. “Clean” the solution to be evaporated as much as possible prior to evaporation. This will minimize the evaporation of toxic air pollutants and prevent fouling of pipes and the evaporator itself. For spent metal working fluid, this means using an oil-water separator prior to the evaporator. Skim oil from the oil-water separator and collect it for disposal.
2. Do not evaporate to dryness. Soluble spent metal working fluid is typically 95% water and 5% additives (oil, surfactants, etc.) that are emulsified in water. The water portion can be evaporated. However, if you evaporate to dryness, the emulsion portion will be evaporated as well and toxic air pollutants may be emitted. To avoid evaporating to dryness, evaporate only 95% of the **water** (see example). At the end of the evaporation process the concentrated emulsion must be removed and disposed of properly. **Note:** Oil-water separators do not remove emulsified additives from your metal working fluids.
3. Service the evaporator at regular intervals. Keep a service log. Make one person responsible for seeing that the log is kept current and work performed as required.
4. Carefully regulate the operating temperature of the evaporator. Use the lowest temperature possible to avoid vaporizing toxic air pollutants. The water in soluble MWF boils at 212° F at sea level and at slightly lower temperatures at higher elevations. Temperature controls should be set and “locked” at or below 212° F, as appropriate.

### ***Evaporator Use Example:***

*100 gallons of spent soluble machine coolant needs to be disposed. The spent coolant contains:*

- *5% tramp oil,*
- *5% emulsified naphthenic oil, chlorinated paraffins, metals, etc.*
- *90% water*

*In this example, the spent coolant contains 5 gallons of tramp oil, 5 gallons of emulsified compounds and 90 gallons of water. This spent coolant is placed into an oil-water separator, which removes the 5 gallons of tramp oil. The remaining 5 gallons of emulsified compounds and 90 gallons of water are placed into an evaporator. Only 95% of the total amount of water should be evaporated. In other words, leave 5% of the **water** in the evaporator (in this scenario ~ 4.5 gallons). Otherwise, compounds will be volatilized, creating toxic air pollution. Excessive evaporation also leads to formation of a baked on residue that is very difficult to clean off the evaporator unit. At the end of the evaporation process, remove the resulting concentrated solution and dispose of properly. In this example 9.5 gallons would be removed (5 gallons emulsified compounds and 4.5 gallons water).*

5. Make sure the evaporator has emergency temperature and water level shutoffs. The emergency high temperature shutoff should be set no more than 230° F. The low level water shutoff should be set at 5% of capacity. This seems redundant to everyone except those people who have had their facilities catch fire.
6. Properly size mist eliminators. High velocity airflows create water droplets that suspend metals and other toxic air pollutants in the exhaust air stream. Suspended pollutants will be carried out the stack unless trapped by a mist eliminator. A good vendor will make sure that your evaporator has a properly sized mist eliminator.



## Compliance Issues—Air

Air pollution control authorities regulate evaporation processes that emit toxic air pollutants. Some of the toxic air pollutants of concern that might be found in spent metal working fluids include:

- cadmium compounds
- lead compounds
- aluminum
- borates
- chromium (II, III, VI, & metal)
- iron oxide fume ( $\text{Fe}_2\text{O}_3$ )
- copper
- tin
- oil mist (mineral)
- iron salts
- selenium
- zinc

There currently is no minimum level for toxic air pollutants that will exempt a business from regulatory review. If a business determines that they wish to evaporate a wastestream that contains or could contain a toxic air pollutant, they should contact their local air authority (See Appendix E for contact numbers).

The following are possible outcomes of a regulatory review:

- **Not Regulated**—Evaporators do not require regulation if the liquid evaporated does not contain a toxic air pollutant.
- **Registered**—Evaporators that generate small amounts of toxic air pollutants must be registered with the local air authority.
- **Permitted**—Businesses with evaporators over a certain size may need to obtain an air operating permit. Businesses that generate more than 10 tons of a single toxic air pollutant or 25 tons of toxic air pollutant (combined) are required to obtain a Title V air operating permit.

## Compliance Issues—Hazardous Waste

Businesses that choose to evaporate spent metal working fluid that designates as hazardous waste, are performing what is known as “Treatment by Generator.” Treatment by generator requirements include the following (see Appendix F for more information):

- Hazardous waste management rules apply. For example, containers used to hold dangerous waste MWF must have secondary containment and be labeled “Dangerous Waste” and “Toxic”. (See Table 7 on page 18-20 )
- The spent metal working fluid must be counted before and after placement into the evaporator. Businesses that evaporate dangerous waste must log the pounds of dangerous waste being evaporated. The counting rules are explained in more detail in Ecology’s “Counting Dangerous Waste Under the Dangerous Waste Regulations” publication (# 98-414).

*NOTE: Evaporating spent MWF that does not designate as dangerous waste may generate residue that is dangerous waste.*

# Chip Management

Metal chips are one of the two main wastestreams generated at metal machining facilities. Because such large volumes of waste metal are generated, most metal machining facilities find that it makes economic sense to recycle their waste chips. Recycling is the standard industry practice for managing waste metal chips.

## Chip Recycling

The key pollution prevention issue in recycling metal chips is separating the metal working fluids from the chips. This separation achieves two benefits simultaneously. As more fluid is recovered, more can be recycled and reused, thereby reducing the amount needing to be purchased by the facility. Separating the fluids from the chips also reduces the potential contamination of stormwater when the chips are stored outside, or during loading and transportation. Furthermore, most metal recyclers require that chips be well drained prior to pick-up.

A number of different methods for draining chips are used at metal machining facilities. Some facilities manually shut off the chip conveyor for a period of time and allow the fluids to drain back into the machine sump. Centrifuges and chip wringers are also commonly used to drain chips. At low RPMs, centrifuges can also be used for separating tramp oils from metal working fluids. A more passive chip draining system consists of drums, with screens on top, set at the end of the conveyor belt. In this system, the fluid coated chip falls off the conveyor belt onto the screen. Over time, the fluid will drain through the screen and the dry chips can be transported to waste chip storage containers and the collected fluids can be recycled.

Overall, the best method is one that allows the fluid to drain from the metal chip as soon as possible before the fluid has a chance to begin evaporating. This prevents chemical residues from drying on the chips. These residues have the potential to contaminate stormwater.

## Marketing Issues

Facilities normally separate their chips by metal type in order to get the highest price from their metal recycling company. Metal recyclers may also offer a higher price to a facility if the

chips are compressed into a briquette through the use of a briquetting machine. (See Appendix C: Vendor Directory). The cost/benefit analysis for purchasing such a machine includes the price of the machine, the price offered for briquettes versus loose chips, and the volume of chips the facility generates.

## Stormwater Issues

Inside storage of waste chips is highly recommended, if enough space exists at the facility. Outside storage introduces the possibility that stormwater will become contaminated from contact with the metal working fluid residues on the waste chips. Depending on the fluid used, these residues may contain metals, oils and/ or chlorinated paraffins. Inside storage virtually eliminates this potential stormwater contamination problem. However, if chips need to be stored outside, use the following precautions to avoid stormwater contamination:

- ✓ **Be sure fluid has completely drained before placing chips in storage containers.** Any fluids or fluid residues have the potential to contaminate stormwater either at your facility or when stored at the recycling company.
- ✓ **Cover outside chip storage containers.** This will eliminate the possibility that clean rainwater will become contaminated by contact with residues on the chips.
- ✓ **Place chip storage containers on concrete or asphalt surface** to prevent spills and leaks to bare ground. Installing a perimeter berm or curb further reduces the possibility of contaminating soils.
- ✓ **Continue draining fluids, if necessary.** If it is necessary to place chips outside before they are completely drained be sure that your outside storage containers allow drainage to continue. Many facilities simply tilt the waste chip dumpster towards one end and excess fluids to drain through a hole into a residue container.
- ✓ **Check often for leaks.** Be sure that outside storage containers and/or residue containers do not have holes in them.
- ✓ **Monitor and maintain containers on a regular basis.** Empty storage or residue containers and do not allow them to overflow.

## Stormwater Regulations

Ecology's stormwater regulations require most industrial facilities to have a stormwater permit. Any facility that discharges stormwater to surface water, or into a storm sewer which leads to a surface water, must apply for a stormwater permit. If all of the stormwater from a facility discharges to the ground and/or to a combined storm/sanitary sewer, a permit is not required. Facilities that need a stormwater permit and fail to apply for one could be subject to legal actions.

The permit requires industrial facilities to develop a Stormwater Pollution Prevention Plan. These plans should identify existing and potential sources of stormwater pollution, and describe how the facility will reduce or eliminate that pollution. Additional specific planning requirements are detailed in the permit.

Contact an Ecology staff person in your region if:

- You are uncertain if your facility needs a stormwater permit
- You have any questions about current practices and possible stormwater impacts at your facility

See the inside front cover for a regional map to identify your region

Northwest Regional Office - Bellevue  
Ron Devitt (425) 649-7028  
Bob Newman (425) 649-7046  
Bob Wright (425) 649-7060

Southwest Regional Office - Olympia  
Dick Schroeder (360) 407-6273

Eastern Regional Office - Spokane  
Paul Turner (509) 625-5181

Central Regional Office - Yakima  
Pam Perun (509) 454-7869

# Floor Cleaning

## Routine Maintenance

In the metal machining industry the presence of spilled or leaked metal working fluids, hydraulic oils, or tapping fluids can cause floor mop water to designate as a dangerous waste. This is especially true if these fluids contain chlorinated paraffins.

Mop water from floor cleaning should be tested and designated to verify whether or not it is dangerous waste. Testing must be done in accordance with the requirements under the State Dangerous Waste Regulations (WAC 173-303-090 and -100). Common dangerous waste constituents to test for include: lead, cadmium, chromium, selenium, copper and zinc. Zinc bearing metals (i.e. brass) and zinc-plated parts that are machined often contain lead. If the metal working fluid or hydraulic oils being used contain chlorinated paraffins, the mop water should be tested for total halogens. Also, depending on the chemical make-up of some cleaning agents and/or cleaning solvents, mop water may designate as a hazardous waste.

## Mop Water Disposal Options

The following management options apply to mop water depending on whether or not it is dangerous waste:

### Mop water that is NOT a dangerous waste:

- May be discharged to a sewer system **after receiving the local sewer district's approval**. Mop water may exceed the sewer district's limits for oil and greases.
- Must not be discharged to storm drains, dry wells, or septic systems. Businesses must know where drains lead before using them.
- Should not be mixed with spent metal working fluid. See Step 3 on page 14. **Has the spent MWF been mixed with other wastestreams?**

### Mop water that IS a dangerous waste:

- Must be managed as dangerous waste. Management requirements depend on the generator status of the business. For more information on management requirements, reference Table 7, titled "Guide for Dangerous waste (DW) Generators in Washington."
- Must not be mixed with any other non-dangerous wastes; otherwise the entire wastestream becomes a dangerous waste and must be managed as such.
- Small quantity generators may treat the mop water onsite or ship it offsite to a permitted temporary storage disposal facility, local moderate risk waste facility, or other permitted solid waste facility (WAC 173-303-070 (8) (b)(iii)).
- Mop water must meet two conditions in order to be discharged to a sewer system. It must be treatable by the local sewer district and must be either a state-only waste or a highly diluted federally listed waste. Before discharge, a business needs to obtain an appropriate permit issued by the Department of Ecology or local sewer district (WAC 173-303-071(3)(a)). This mop water is excluded from dangerous waste counting requirements unless it is treated before discharge. See Ecology Publication #94-136, Revised 6/97, Domestic Sewage Exclusion for more information.
- Mop water that is a characteristic waste must be managed as a dangerous waste. Furthermore, the Domestic Sewage Exclusion does not apply to mop water that is a characteristic waste. You may wish to consider using treatment-by-generator options, such as evaporation, as a means of minimizing the volume of waste. See Appendix F: Treatment By Generator.

The following suggestions will help keep mop water from becoming dangerous waste:

- Don't use mop water to clean up solvent or oily spills.
- Don't mix normal mop water with water that is used during the clean up of spilled solvent or chlorinated fluids and oils.
- Prevent leaks by properly maintaining equipment.

## **Spills-Absorbent Waste Disposal**

The same constituents that can cause mop water to become dangerous waste can also cause floor absorbent to become dangerous waste. These constituents include lead, chromium selenium, zinc, copper, chlorinated paraffins, solvents, etc. Testing must be done in accordance with the requirements under the State Dangerous Waste Regulations (WAC 173-303-090 and -100).

Absorbents are often used to clean up wastes that are managed as used oil, such as way oils and spent MWF. It is often incorrectly assumed that these contaminated absorbents can always be managed as used oil. Ecology's proposed policy concerning used oil states that:

"Materials that are not dangerous waste and that contain or are otherwise contaminated with used oil in recoverable quantities can be managed as used oil."

Under normal conditions, spent absorbents used to cleanup oil spills do not contain recoverable quantities, therefore, they are not subject to the used oil standards. If the spent absorbent does not contain hazardous constituents, they may be managed as a solid waste. Disposal options for waste absorbents depend on whether or not they are dangerous waste.

### **Waste absorbent that is NOT dangerous waste:**

- Can be disposed in a dumpster upon the approval of the local landfill or solid waste hauler. Sufficient absorbent must be used to prevent the presence of free liquids.

### **Waste absorbent that IS dangerous waste:**

- Must be managed as a dangerous waste (See Table 7).
- Small quantity generators may treat this waste onsite or ship it offsite to a permitted temporary storage disposal facility, local moderate risk waste facility or other permitted solid waste facility (WAC 173-303-070 (8) (b)(iii)).

The following suggestions may decrease the amount of absorbents needed or prevent absorbents from designating as dangerous waste:

- Contain leaks in catch basins or spill pans in place of pads. Liquid can be reused, recycled, or properly disposed.
- Vacuum spills and reuse, recycle, or properly dispose the recovered liquid.
- Use rags that can be wrung out and laundered for reuse. Recovered liquid can be reused, recycled, or properly disposed.

## Health Concerns

Department of Labor and Industry has done substantial work with health concerns in the metal fabrication industry through their SHARP program. Key information from this program is excerpted below from the fact sheet titled, “Metal Working fluids: A Fact Sheet for Workers” (#46-1-1997). The entire fact sheet and additional information can be found on their website at <http://www.wa.gov/lni/sharp/> or by phone at (888) – 66 – SHARP.

### Who is Exposed to MWFs?

According to the National Institute for Occupational Safety and Health (NIOSH), over 1 million workers in the United States are exposed to MWFs. Here at the Safety & Health Assessment & Research for Prevention (SHARP) program, we have estimated that approximately 20,000 workers in Washington State use MWFs. While machinists, machinery mechanics, metalworkers, and other machine operators and setters have the greatest contact with MWFs, workers performing assembly operations can also be exposed if MWFs remain on the machined product. Workers can be exposed to MWFs by skin contact, or by inhaling (breathing in) or ingesting (swallowing) particles, mists, and aerosols.

### What are MWFs’ Health Effects?

Although recent changes in MWF formulations have resulted in safer products, it is important to realize that MWFs can still contain substances that are harmful to your health. The most commonly observed illnesses associated with MWF use are:

#### Skin Problems

Skin contact with MWFs is very common, since MWFs are often applied to the machine tool in large volumes. Workers’ skin can be covered with mist or spray while machining, or handling parts and tools covered with residual fluid.

MWF-soaked rags and clothing can prolong the length of time that the MWF is in contact with the skin. MWFs have been shown to cause numerous skin problems, ranging from dermatitis due to irritation or allergy (very common) to skin cancer (relatively rare). NIOSH has observed that between 14% and 67% of workers using MWFs have dermatitis.

#### Cancer

There is evidence to suggest that exposures to some MWFs can increase workers’ risk for cancer of the skin, esophagus, stomach, pancreas, larynx, colon, rectum, and other organs. However, the link between MWF exposure and cancer is controversial, since the epidemiological studies were performed on workers who were exposed to MWFs as long as 20-30 years ago. Before the 1950s and 1960s, some MWFs contained relatively high concentrations of substances suspected to cause cancer (mostly polycyclic aromatic hydrocarbons and nitrosamines).

Since then, industry actions have resulted in substantially reduced concentrations of these substances in MWFs. However, it is unclear whether these changes have eliminated the cancer risk because it is not known if the cancer-causing substances are present in the MWFs themselves, or whether they are constituents of MWF additives or contaminants.

#### Lung Disease

Inhaling the aerosols, particles, and mists generated by MWFs while machining is a common source of exposure. Several lung diseases are associated with inhaling MWFs, including asthma, acute airway irritation, hypersensitivity pneumonitis, lipid pneumonia, chronic bronchitis, and possibly lung cancer. NIOSH researchers suggest that machinists face an increased risk of asthma at concentrations below the current permissible exposure limits (PELs).

## What Occupational Standards Apply to MWFs?

The two most important occupational standards that apply to MWFs are those for “particulates not otherwise regulated” and “oil mists”. In Washington State, the PEL for “total” particulates is 10 milligrams of total particulate per cubic meter of air ( $10 \text{ mg/m}^3$ ), based on an 8-hour time weighted average (TWA). This means that exposures to total particulates can legally exceed  $10 \text{ mg/m}^3$  at times, but only if concentrations are below  $10 \text{ mg/m}^3$  at other times, so that the *average* exposure for any 8-hour workshift is  $10 \text{ mg/m}^3$  or less. The PEL for oil mists is an 8-hour TWA of  $5 \text{ mg/m}^3$ .

NIOSH is concerned that workers may experience adverse respiratory effects if they are exposed at the current PELs. NIOSH recommends that occupational safety and health programs that include medical monitoring should be established at MWF-using workplaces. As of summer 1997, NIOSH is finalizing its “Criteria Document” (see sidebars on page 3) and OSHA (the Occupational Safety and Health Administration) is convening a committee of national experts to develop a proposal for a new standard to lower workplace exposures and increase worker protection. PELs also exist for certain additives and other MWF Constituents.”

## Appendix A: Glossary

Biocide	A chemical additive used to kill organisms in metal working fluids. Biocides include bactericides and fungicides. Bactericides kill bacteria and fungicides kill fungus.
Coalescer	Porous-media separators which use oil attracting media beds to attract oil in preference to water.
Extra Pressure (EP) Additives	These additives are commonly composed of halogenated paraffins. The halogen in the compound complexes with the metal workpiece and adds extra lubrication for increased tool life.
Halogenated	A compound containing any one of the halogen series of elements. These are commonly chlorine, bromine, and iodine in metal working fluids.
Metal Working Fluid(MWF)	Metal Working Fluid is used in machining metal parts to cool and lubricate the tool pieces, thus prolonging the life of the tool.
Oil Skimmers	Oil skimmers remove the tramp oil and debris from the surface of the metal working fluid. They use either a rotating disk, a moving belt, or a moving rope that dips into the tank, and attracts the tramp oil to its surface. The tramp oil is then scraped off the disk, belt, or rope and into a container.
Paraffin	Paraffins are long, straight carbon chain organic molecules with no cyclic or ring structures in their molecular makeup. They are primarily composed of carbon and hydrogen and may have halogens attached for extra properties.
Semi-Synthetic Fluid	This fluid is the same as the synthetic fluid (below) but has a small amount of oil added (2-20%).
Soluble Oil Fluid	A concentrate of severely hydro-treated oils combined with large amounts of emulsifiers. This combination allows the fluid to mix with water into a solution.
Straight Oil Fluid	A fluid that consists of solvent-refined or hydro-treated petroleum oil or other oils of animal or vegetable origin.
Sump	A tank that holds metal working fluid.
Synthetic Fluid	A concentrate that is added to water to form an aqueous metal working fluid. The concentrate does not contain crude oil, or oil of any other kind. This fluid is commonly made up of amines, nitrites, nitrates, phosphates, soaps, and glycol.
Tramp Oil:	Tramp oil is most commonly made up of way oil (the lubrication used for the sliding parts of the machine) and hydraulic oils that fall, or are carried into the metal working fluid.



# Appendix B: List of Pollution Prevention Opportunities by Operation

## Sump Maintenance

### 1. Cover Sumps:

By covering the metal working fluid (MWF) sumps in machines, airborne microorganisms are kept out of the fluid. This is important because a large number of the microbes that contaminate fluids are airborne. Covers also keep out trash such as dust, cigarette butts and food.

### 2. Sump and Trench Maintenance:

Periodically cleaning out the MWF sumps and trenches will keep them free of solid matter that can hamper fluid flow. Solid materials provide excellent areas for microbe growth and may clog up MWF lines. Disinfect sumps and trenches when MWF fluid is removed. Without the disinfecting step, new MWF fluid will be inoculated with left over bacteria when it is added to the sump.

### 3. Leave Machine MWF Pumps On during Downtime:

While the machine is not in operation, leave the MWF circulating through the machine to help aerate the fluid and keep it from becoming stagnant.

### 4. Movement of Fluid in Sump:

A small pump can be used to circulate fluid in a sump, preventing stagnation and anaerobic microbial growth in the fluid.

### 5. Sump Size:

By keeping the sump size as small as possible, the fluid has a greater flow-through rate, and will not become stagnant.

## Metal Working Fluid Selection

### 6. Use Chlorine Free MWFs:

The proposed regulations, if adopted, will prohibit waste MWF formulated with halogenated compounds from being designated as used oil. Halogenated compounds include chlorine, bromine, and iodine (see glossary).

### 7. Number of MWFs:

Use the smallest number of different MWFs as possible. This simplifies the variability in MWF management and minimizes the overall amount of management required.

### 8. Use High Quality MWFs:

The use of high quality MWFs is recommended because these fluids are more resistant to biological attack and additive breakdown. This resistance allows them to be used many times without a loss of performance.

### 9. Look at the Compatibility of Way Oils and MWF's:

Ensuring that way lubricants and MWFs easily separate will help in the treatment and recycling process. Select a way oil that does not cause foaming problems or impair the separation characteristics of the two fluids. High-grade way oils typically separate easily from MWF. In addition, they contain little or no sulfur compounds that are a food source for bacteria.

## Metal Working Fluid Maintenance Plan

### 10. Daily Inspections:

Conducting daily inspections of each machine will help identify problems and trends, and speed up machine repair through early identification of problems. This contributes to less downtime and less fluid waste.

### 11. Operator Responsibility:

The maintenance of metal working fluids (MWF) should be limited to only one person or a team of people who are trained and knowledgeable about fluid maintenance. This will reduce fluid property variances and help cut down on the overuse of MWF.

## Metal Working Fluid Testing

### 12. Monitor Concentration:

Keeping the concentration of the MWF in the correct range will ensure that only the right amount of concentrate is used. It will also help control any gumming, sticking or smearing left on workpieces due to excess concentrate. Refractometry and titration are the most common techniques for measuring fluid concentration.

**13. Monitor pH:**

By monitoring the pH of the MWF, problems with the fluid can be spotted. A drop in pH may mean that there is a high microbe count in the fluid, or that impurities are building up. Keeping the pH in the correct range will help control microbial growth, and help reduce foaming and separation of the fluid.

**14. Keep Log of Monitoring Data:**

Keeping a log of fluid characteristics, such as pH and concentration, will help identify trends, solve problems, and keep the fluid in the proper condition.

**Recycling Systems****15. Tramp Oil Skimmers:**

These come in several different types including rope, belt and disk skimmers. Skimmers remove the oil that makes its way into the MWF and floats on the surface of the fluid. Oil removal helps keep the fluid aerated with dissolved oxygen, and reduces the food source for microorganisms.

**16. Aerate/Ozonate:**

By aerating the MWF or using an ozone generator to bubble oxygen through the fluid, the anaerobic microbe count will be kept low. Dissolved oxygen in the water keeps anaerobic bacteria from growing and creating the “Monday morning stink.” MWF treated with dissolved ozone reduces the microbe count. Ozone is highly toxic to microbes and kills them.

**17. Central Recycling Systems:**

Central recycling systems allow a large volume of fluid to be treated at once. Small-wheeled versions (about the size of a large shopping cart) are available. A good recycling system includes a settling tank, oil skimmer, coalescer, and an aeration device

**Chip Management****18. Chip Filters:**

Filters keep the chips and grit created in the machining process from contaminating the MWF sump. The high amount of surface area created by the chips provides an excellent area for microbe growth. Thus, filtering helps to lower the bacteria count.

**19. Drain Metal Chips to Recover Fluid:**

One way of draining metal chips is to place them into a perforated container with a catch basin and reuse the collected metal working fluid. Another option is to manually shut off the chip conveyor for a period of time and allow the fluids to drain back into the machine sump. A chip wringer or centrifuge can be used to get even more fluid from the chips. These processes produce higher quality chips for recycling.

**20. Recycle the Metal Chips and Scrap:**

Many, but not all, metal recyclers will take chips. They will usually require chips to be segregated by metal type and free of oil. A higher price can usually be obtained if chips are compressed into briquettes through the use of a briquetting machine.

**21. Store Chips Under Cover:**

By storing metal chips and shavings inside or under cover, the risk of contaminating stormwater is reduced, and the chips are kept at a better quality. Store chips on an impervious surface to prevent soil contamination from leaks and spills.

**Spills****22. Pumps, Spigots, and Funnels:**

Using pumps, spigots and funnels when transferring MWF will reduce the amount of lost fluid and the risk of spilling fluids.

**23. Reuse Absorbent Pads:**

Using absorbent pads that can be wrung out and reused will cut down on the amount of absorbent material that must be discarded as hazardous waste, and save money in fresh absorbent and waste handling costs. Another option is to dedicate a mop for the clean up of oily spills.

**24. Use Catch Basins:**

Contain leaks in catch basins instead of using absorbent pads.

**25. Vacuum Spills:**

Vacuum spills instead of using absorbent pads or catch basins. The recovered fluid can be reused, recycled, or properly disposed.

**Other****26. Fix Leaking Seals and Gaskets:**

This keeps the fluid where it belongs, instead of on the floor or all over the machine and operator. Even small leaks can waste a surprising amount of fluid over time.

**27. Gasket and Seal Compatibility:**

Make sure that the gaskets and seals on machine equipment are not degraded by either the way oil or the MWF.

**28. Use Distilled or Deionized Water:**

Using distilled or deionized water keeps dissolved minerals out of the MWF. These contaminants can build up in the fluid as the water in the fluid evaporates, causing separation of the concentrate from the water.

**29. Tramp Oil Separation:**

Tramp oils and MWF should be thoroughly separated before skimming the tramp oils off the top. This will reduce the amount of MWF that is wasted with the removal of the tramp oil.

**30. Biocide Addition**

If other methods do not work, the addition of a biocide/fungicide can help extend the life of MWFs. These additives should be used sparingly, and only as a last resort. When fluids with biocides are spent, they should be tested to determine if they are a hazardous waste. Some biocides contain chlorinated compounds.

**31. Wash hands to reduce bacteria:**

Machinists frequently come in contact with metal working fluids and humans are a primary source of bacteria. Washing hands regularly will reduce the spread of bacteria.

**32. Cooling of the MWF:**

Keeping the MWF cool will help slow the growth of microbes in the sumps and fluid areas.

# Appendix C: Vendor Directory

## Equipment

Most of the following vendors were taken from the Thomas Register and are samples of vendors in each category that serve the metal machining industry. For a complete listing of vendors, see the Thomas Register at [www.thomasregister.com](http://www.thomasregister.com).

## Coolant Recovery Systems:

Cecor, Inc., Verona, WI  
(800) 356-9042

Como Industrial Equipment, Inc.,  
Janesville, WI  
(800) 451-0028 x25  
[www.comoindustrial.com](http://www.comoindustrial.com)

Coolant Wizard, Inc., Indianapolis, IN  
(317) 545-5380 or (888) 476-5959

Deer Path Industrial Technology, Inc.,  
Issaquah, WA  
(425) 391-9223

Edjetech Services, Wellington, OH  
(888) 856-4865

Hyde Products, Inc., Cleveland, OH  
(800) 999-0009 or (440) 871-4885  
[www.hydeweb.com](http://www.hydeweb.com)

Hydroflow, Inc., Salem, NH  
(603) 898-3388

Lakos Filtration Systems, Fresno, CA  
(559) 255-1601  
[www.lakos-laval.com](http://www.lakos-laval.com)

Monlan/Chemaperm, Kalamazoo, MI  
(616) 382-6348

Sanborn Technologies, Medway, MA  
(800) 343-3381 or (503) 533-8800  
[www.sanborntech.com](http://www.sanborntech.com)

## Chip Briquetting Systems:

Counselor Engineering, Inc., Hudson, OH  
(800) 783-6567

Deer Path Industrial Technology, Inc.,  
Issaquah, WA  
(425) 391-9223

Gensco America Inc., Decatur, GA  
(800) 268-6797  
[www.genscoequip.com](http://www.genscoequip.com)

Komar Industries, Inc., Groveport, OH  
(800) 311-9068 or (614) 836-2366  
[www.komarindustries.com](http://www.komarindustries.com)

Lewis Corp., Pocatello, ID  
(800) 658-5122  
[www.lewiscorporation.com](http://www.lewiscorporation.com)

Multipress, Inc., Columbus, OH  
(614) 228-0185  
[www.multipress.com](http://www.multipress.com)

Scanrec, Waco, TX  
(800) 577-3766  
[www.scanrec.com](http://www.scanrec.com)

## Chip Wringing Equipment (Centrifuges)

Barrett Centrifugals Inc., Worchester, MA  
(800) 228-6442

Chip Systems International, Scotts, MI  
(616) 626-8000

Prab Conveyors, Kalamazoo, MI  
(800) 252-9730  
[www.prab.com](http://www.prab.com)

Inter-Source Recovery Systems,  
Kalamazoo, MI  
(800) 334-1470  
[www.Inter-Source.com](http://www.Inter-Source.com)

National Conveyors Co. Inc., East  
Granby, CT  
(800) 945-9139 x12  
[www.nationalconveyors.com](http://www.nationalconveyors.com)

Rousselet Centrifuge, Inc., Bethesda, MD  
(888) 776-5923

## **Evaporation Systems:**

Equipment Manufacturing Corp, Whittier, CA  
(888) 833-9000  
www.equipmentmanufacturing.com

Environmental Hydrotech, Inc., Croton, NY  
(914) 736-0200

Hyde Products, Inc., Cleveland, OH  
(800) 999-0009 or (440) 871-4885  
www.hydeweb.com

Landa Water Cleaning Systems, Camas, WA  
(800) 547-8672 or (360) 833-9100  
www.landa-inc.com

Nordale Environmental Engineering, Clinton, IA  
(800) 991-1415  
www.nordale@nordale.com

Patterson Industries LTD, Ontario, Canada  
(800) 336-1110 x1078  
www.pattersonindustries.com

## **Tramp Oil Separators:**

Edjotech Services, Wellington, OH  
(888) 856-4865

Environmental Protection Associates, Inc., Seattle, WA  
(800) 299-3721

Hyde Products, Inc., Cleveland, Ohio  
(800) 999-0009 or (440) 871-4885  
www.hydeweb.com

Stouder Engineering & Machine, Hagerman, ID  
(208) 837-4663

World Chemical USA, Inc., Torrance, CA  
(888) 860-3364  
www.worldchemusa.com

## **Services**

Recycling of Metal Chips/Shavings/Borings  
(also call Ecology's Hotline, 1-800-RECYCLE)

City Junk Inc., Tukwila, WA  
(206) 763-3024

Independent Metals Co., Seattle  
(206) 763-9033

Pacific Iron and Metal, Seattle  
(206) 628-6232

Riverside Salvage and Metal Co.  
(206) 932-7262

Seattle Iron and Metals Corp., Seattle  
(206) 682-0040

West Seattle Recycling Ctr., Seattle  
(206) 935-4255

## **Waste Metal Working Fluid Disposal**

### **Metal Working Fluid Recovery (for non-hazardous, water soluble fluids)**

Basin Oil, Seattle  
Philip Services, Renton  
(800) 439-2948  
(800) 228-1130

Keep it Clean Recycling, Redmond  
Seaport Petroleum  
(425) 868-3535  
(206) 228-7872

**For Disposal of MWF as used oil or  
hazardous waste:**

Advanced Environmental Tech Svs,  
Tukwila  
(800) 334-2387

Amalgamated Services, Inc., Sumner  
(800) 273- 9248

Clean Care Corp., Federal Way  
(800) 282-8128

Envirotech, Seattle  
(800) 922-9395

FBN Environmental, Kirkland  
(425) 820-8115

Front Water Services, Seattle  
(800) 545-3520

Keep It Clean Recycling, Redmond  
(425) 868-3535

Philip Services, Renton  
(800) 228-7822

Protective Environmental Svcs, Seattle  
(206) 624-5503

Romic Environmental Technologies,  
Tacoma  
(253) 627-7790

Safety-Kleen, Lynnwood  
(425) 775-7030

Shultz Distributing, Seattle  
(800) 286-0896

# Appendix D: Interim Used Oil Policy




STATE OF WASHINGTON

## DEPARTMENT OF ECOLOGY

P.O. Box 47600 • Olympia, Washington 98504-7600  
(360) 407-6000 • TDD Only (Hearing Impaired) (360) 407-6006

March 23, 1999

TO: All Interested Parties

FROM: Greg Sorlie, Manager   
Hazardous Waste and Toxics Reduction Program

SUBJECT: Notice of interim policy on materials containing used oil that can be managed as used oil

### Background on interim policy

Ecology is issuing this interim policy to describe the materials containing or contaminated with used oil that can be managed as used oil in Washington. Additionally, this notice describes other changes that will occur with adoption of the federal used oil management standards (UOMS). The federal UOMS will be proposed in 1999, with modifications to address Washington State issues and adopted in the Spring of 2000.

Washington presently has standards for used oil burners and marketers in Section 515 of Chapter 173-303 WAC. In addition to standards for burners and marketers, the UOMS will establish comprehensive management standards for transporters, generators, collection centers, and processors/rerefiners of used oil.

### Materials containing used oil that can be managed as used oil

An integral part of the Federal UOMS is the applicability statements of 40 CFR part 279.10. These statements address materials containing or contaminated with used oil that can be managed under the federal used oil regulations. At present, Chapter 173-303 WAC does not have applicability statements similar to the applicability statements of 40 CFR Part 279.10. Consequently, in Washington only those materials meeting the definition of used oil can be managed under the State's used oil regulations. To address this difference between federal and state used oil regulations, this interim policy clarifies the materials that can and cannot be managed as "used oil" in Washington with a list of examples of those materials. It is Ecology's expectation that this policy will be consistent with the application of the federal UOMS when they are proposed in 1999.

With the UOMS proposal, Ecology will continue to communicate the message to generators that wastes and products should not be mixed with used oil. Waste streams should be segregated and managed separately. Ecology acknowledges, however, that materials may become contaminated with used oil through normal use of the oil. If this is the case, the mixture is subject to WAC 173-303-515.

“Materials” that are not dangerous waste and that contain or are otherwise contaminated with used oil in recoverable quantities can be managed as used oil. If the “materials” are dangerous waste, the mixture must be managed as a dangerous waste and not as used oil. The following list gives examples of materials contaminated with used oil that can be managed as used oil under this interim policy using WAC 173-303-515.

- Oil filters with oil.
- Cellulose or nonhalogenated organic polymer sorbents contaminated with oil from spill cleanups.
- Used oil mixed with soil when the oil is recoverable.
- Recovered oil/water/solid mixtures from oil water separators.
- Tank rinse-water and wash-water with recoverable used oil.
- Bilge-water with used oil.
- Solvent contaminated with used oil *when the solvent before and after use is not dangerous waste (Ecology strongly encourages recycling of these solvent waste streams on-site or through a solvent recycler).*
- Sump clean-out water with recoverable used oil.

**Revisions to the UOMS that will be proposed in 1999.**

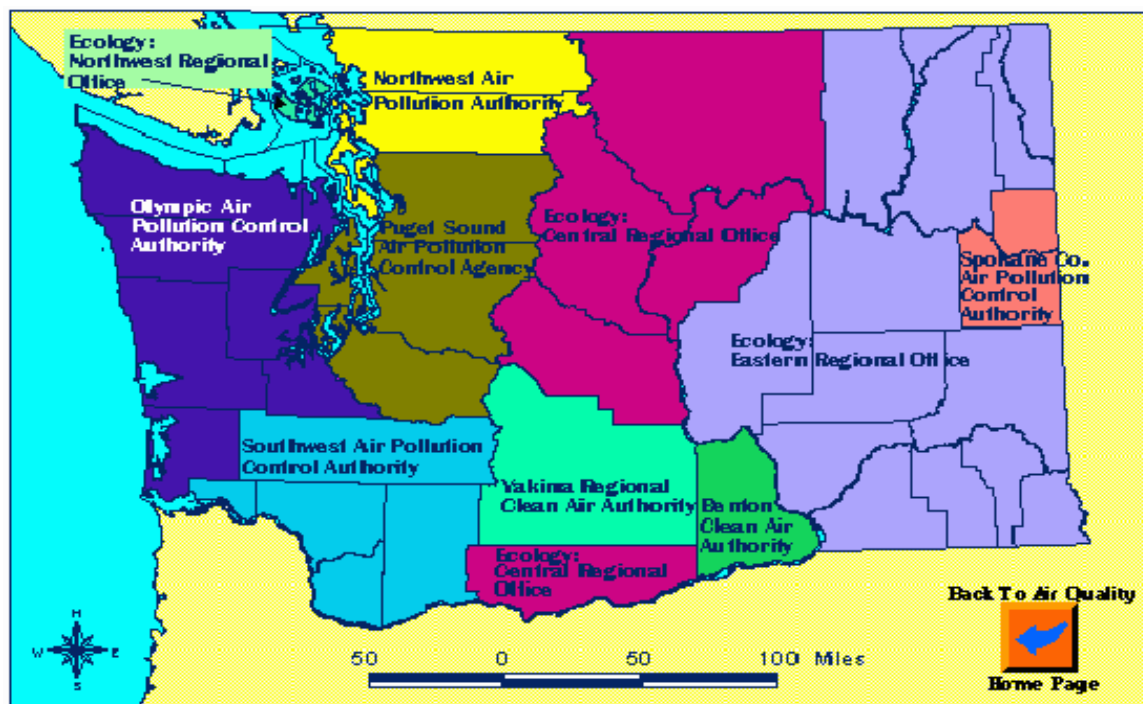
Ecology will be proposing only a few revisions to the UOMS in 1999. The significant revisions are as follows:

- Metal working fluids with chlorinated paraffins  
Ecology will clarify the regulatory status of metal working fluids with chlorinated paraffins. These fluids will be able to be managed as used oil under Ecology’s proposal when on a pathway for rerefining or reclaiming, however, they will not be able to be burned for energy recovery under the used oil management standards. Because of the high level of chloride in these fluids, Ecology is concerned about the generation of chlorinated dibenzo-dioxins (CDDs) and chlorinated dibenzo-furans (CDFs) during burning. Ecology believes the burning standards of WAC 173-303-510 (dangerous wastes burned for energy recovery) and the incineration requirements of WAC 173-303-670 provide the necessary standard of care for the burning of metal working fluids with chlorinated paraffins.
- Storage limit at used oil processors  
Used oil or materials containing or contaminated with used oil that are not moved into active processing within three months of arrival at a processor or re-refiner are considered speculatively accumulated and subject to designation under the Dangerous Waste Regulations.
- Mixing of hazardous waste  
Ecology will clarify that conditionally exempt small quantity generator waste and characteristic and criteria dangerous waste should not be mixed with used oil. If this occurs, the mixture will remain subject to the Dangerous Waste Regulations as a dangerous waste.

**Department of Ecology staff contact:** Tom Cusack (360) 407-6755.



## Appendix E: Map of Air Pollution Control Authorities



## Sources of Information about Air Pollution in Washington State

1.	<b>Olympic Air Pollution Control Authority</b> (Clallam, Grays Harbor, Jefferson, Mason, Pacific, Thurston Counties) 909 Sleater-Kinney Road SE, Suite 1 Lacey WA 98503-1128 Charles E. Peace, Executive Director Telephone: (360) 438-8768 or 1-800-422-5623 Fax: (360) 491-6308; E-mail: <a href="mailto:oopca@wln.com">oopca@wln.com</a> Internet: <a href="http://www.wln.com/~oopca">http://www.wln.com/~oopca</a>	2.	<b>Department of Ecology Northwest Regional Office</b> (San Juan County) 3190-160 <sup>th</sup> Avenue SE, Bellevue, WA 98008-5452 Telephone: (425) 649-7000 Fax: (425) 649-7098, TDD: (425) 649-4259
3.	<b>Northwest Air Pollution Authority</b> (Island, Skagit, Whatcom Counties) 1600 South Second Street Mount Vernon, WA 98273-5202 Terry Nyman, Air Pollution Control Officer Telephone: (360) 428-1617 Telephone: 1-800-622-4627 (Island & Whatcom) Fax: (360) 428-1620; E-mail: <a href="mailto:info@nwair.org">info@nwair.org</a> Internet: <a href="http://www.nwair.org">http://www.nwair.org</a>	4.	<b>Puget Sound Clean Air Agency</b> (King, Kitsap, Pierce, Snohomish Counties) 110 Union Street, Suite 500 Seattle, WA 98101-2038 Dennis J. McLerran, Air Pollution Control Officer Telephone: (206) 343-8800 or 1-800-552-3565 1-800-595-4341 (Burn Ban Recording) Fax: (206) 343-7522; E-mail: <a href="mailto:psapca@wolfenet.com">psapca@wolfenet.com</a> Internet: <a href="http://www.psapca.org">http://www.psapca.org</a>
5.	<b>Southwest Air Pollution Control Authority</b> (Clark, Cowlitz, Lewis, Skamania, Wahkiakum Counties) 1308 NE 134 <sup>th</sup> Street Vancouver, WA 98685-2747 Robert D. Elliott, Executive Director Telephone: (360) 574-3058 or 1-800-633-0709 Fax: (360) 576-0925; E-mail: <a href="mailto:webmaster@swapca.org">webmaster@swapca.org</a> Internet: <a href="http://www.swapca.org">http://www.swapca.org</a>	6.	<b>Department of Ecology Central Regional Office</b> (Chelan, Douglas, Kittitas, Klickitat, Okanogan Counties) 15 West Yakima Avenue, Suite #200 Yakima, WA 98902-3401 Telephone: (509) 575-2490 Fax: (509) 575-2809, TDD: (509) 454-7673
7.	<b>Yakima Regional Clean Air Authority</b> 6 South 2 <sup>nd</sup> Street, Room 1016 Yakima, WA 98901 Les Ornelas, Director Telephone: (509) 574-1410 or 1-800-540-6950 Fax: (509) 574-1411; E-mail: <a href="mailto:info@yrcaa.org">info@yrcaa.org</a>	8.	<b>Department of Ecology Eastern Regional Office</b> (Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Stevens, Walla Walla, Whitman Counties) 4601 N. Monroe Street, Suite 202 Spokane, WA 99205-1295 Telephone: (509) 456-2926 Fax: (509) 456-6175, TDD: (509) 458-2055
9.	<b>Spokane County Air Pollution Control Authority</b> 1101 West College Ave, Suite 403 Spokane, WA 99201 Eric Skelton, Director Telephone: (509) 477-4727 Fax: (509) 477-6828; E-mail: <a href="mailto:publicinfo@scapca.org">publicinfo@scapca.org</a> Internet: <a href="http://www.scapca.org">http://www.scapca.org</a>	10.	<b>Benton Clean Air Authority</b> 650 George Washington Way, Richland, WA 99352 Dave Lauer, Director Telephone: (509) 943-3396 Fax: (509) 943-0505 or 943-2232; E-mail: <a href="mailto:email@bcaa.net">email@bcaa.net</a> Telephone: (509) 946-4489 (Burn Ban Recording) Internet: <a href="http://www.bcaa.net">http://www.bcaa.net</a>

## Other Sources of Information about Air Pollution in Washington State

### Washington State Department of Ecology

#### Air Quality Program

PO Box 47600, Olympia, WA 98504-7600

Telephone: (360) 407-6800

Fax: (360) 407-6802, TDD: (360) 407-6006

Internet: <http://www.wa.gov/ecology/air/airhome.html>

### Department of Ecology Southwest Regional Office

PO Box 47775

### Pulp Mills, Aluminum Smelters

#### Department of Ecology - Industrial Section

PO Box 47600, Olympia, WA 98504-7600

Telephone: (360) 407-6916

Fax: (360) 407-6902

If you have special accommodation needs, please contact Ecology's Air Quality Program at (360) 407-6800 (Voice) or (360) 407-6006 (TDD), Ecology is an Equal Opportunity and Affirmative Action Employer

## Appendix F:

<b>S A F E   W A S T E   M A N A G E M E N T</b>	
	<b>Treatment by Generator</b>
<i>Technical Information Memorandum</i>	<i>Publication Number 96-412 Revised May, 1999</i>

### Purpose

This Technical Information Memorandum contains treatment by generator (TBG) guidance on how generators may treat their own dangerous waste(s) on-site, in accumulation tanks or containers, without a dangerous waste treatment permit. This document replaces Technical Information Memorandum, #86-3, Revised July 1993.

Section One explains previous guidance for treatment by generator. Section Two provides information on treatment by generator background. Section Three describes the guidance that generators can now use to proceed with treatment by generator. Section Four provides general standards (including definitions) that apply to all generators performing treatment by generator. These sections are followed by a list of Ecology contacts.

### Section One: Previous Guidance

Ecology first provided guidance on treatment by generator in TIM 86-3, dated September 22, 1986. The initial guidance, while useful, also generated questions on treatment by generator. These questions showed a need for additional guidance and clarity on the subject. This is particularly apparent when Ecology and the generator must decide between on-site treatment types or processes, versus off-site treatments or processes at a permitted treatment, storage, or disposal facility (TSD) or a recycling facility.

This revised TIM offers the following benefits for generators:

- ◆ more options for utilizing treatment by generator;
- ◆ less coordination with Ecology, since case-by-case approval is no longer required; and
- ◆ better guidance on how to properly treat hazardous waste so that human health and the environment are protected.

The Department of Ecology actively promotes treatment by generator options for several reasons. The Hazardous Waste Management Act (RCW 70.105.150) lists a waste management hierarchy where treatment is preferred

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over disposal of waste. By encouraging proper on-site treatment, Ecology is working towards the goals of that hierarchy. It should be noted that waste reduction is the ultimate goal.

The Washington State Hazardous Waste Plan (January, 1992) recommends a “close to home” policy. The goal of this policy is “self-sufficiency on the part of individual generators and TSDs, the state as a whole, and the Pacific Northwest region.” Part 2.3 of the Plan states that “The management of wastes on-site should be more actively promoted, to the extent this is environmentally desirable and economically feasible. If other environmental factors are equal, on-site or local management is preferred because it minimizes transportation risks, limits the transfer of risk to other communities, and results in the application of appropriate, waste-specific technologies.”

Lastly, the Ecology *Regulatory Impediment Study* (February, 1993) found that treatment by generator “is not being used to full advantage.” The study states that rules governing treatment by generator lack clear authority, are not self-implementing, and do not describe treatment by generator administrative procedures. This revised TIM solves those problems.

This guidance document is to be used in conjunction with the state *Dangerous Waste Regulations*, Chapter 173-303 WAC, which were amended in 1993 to clarify generator treatment.

## **Section Two: Treatment by Generator Background**

Currently, generator treatment of hazardous wastes is not directly addressed in the federal hazardous waste regulations. However, the state *Dangerous Waste Regulations* were amended in 1993 to address treatment by generator at WAC 173-303-170(3)(b). EPA provided their treatment by generator interpretation in a Federal Register preamble statement on March 24, 1986.

The position set forth in that preamble, 51 FR 10168, reads as follows:

“Of course, no permitting would be required if a generator chooses to treat their hazardous waste in the generator’s accumulation tanks or containers in conformance with the requirements of subsection 262.34 and Subparts J or I of Part 265. Nothing in subsection 262.34 precludes a generator from treating waste when it is in an accumulation tank or container covered by that provision. Under the existing Subtitle C system, EPA has established standards for tanks and containers which apply to both the storage and treatment of hazardous waste. These requirements are designed to ensure that the integrity of the tank or container is not breached. Thus, the same standards apply to a tank or a container, regardless of whether treatment or storage is occurring. Since the same standards apply to treatment in tanks as applies to storage in tanks, and since EPA allows for limited on-site

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storage without the need for a permit or interim status (90 days for over 1000 kg/mo generators and 180/270 days for 100-1000 kg/mo generators), the Agency believes that treatment in accumulation tanks or containers is permissible under the existing rules, provided the tanks or containers are operated strictly in compliance with all applicable standards. Therefore, generators of 100-1000 kg/mo are not required to obtain interim status and a RCRA permit if the only on-site management which they perform is treatment in an accumulation tank or container that is exempt from permitting during periods of accumulation (180 or 270 days)."

Early guidance from the EPA confirmed that treatment by generator applies to all generators who accumulate waste in compliance with 40 CFR 262.34 (WAC 173-303-200 and -201). By deduction, therefore, it does not apply to Conditionally Exempt Small Quantity Generators (CESQGs), who are referred to as Small Quantity Generators (SQGs) in this state. However, Ecology believes that treatment by generator is an appropriate management technique for SQGs and encourages SQGs to manage hazardous wastes by an appropriate treatment by generator method according to this guidance and all applicable local requirements (if any).

There are some restrictions on the type of wastes that may be treated, and what treatment methods are allowed. For example, detonation and open burning are not considered treatment by generator since they are recognized as a method of disposal, that is not allowed under 40 CFR Section 262.34. Treatment by generator in ways other than in tanks or containers (for example, by incineration, open burning, land treatment, or treatment in surface impoundments) still requires a TSD facility permit (for exception, see "Solid State-Only Dangerous Wastes Treated in Units Other Than Tanks or Containers").

### **Section Three: Treatment Specific Guidance**

Ecology encourages treatment by generator when waste reduction possibilities have been exhausted, under certain conditions. A generator conducting treatment by generator does not need to obtain a TSD permit, or comply with interim status requirements. The following guidance does not apply to generators recycling materials on-site. This is because the reclamation process itself is generally exempt from treatment by generator or treatment permitting requirements.

By following the guidance in this TIM, the generator may use a specific waste treatment method, a treatment method that is not one of the specific Fact Sheet options, or treat a solid state-only waste in a unit other than a tank or container, without Ecology review, written approval or a permit. However, the department may determine, on a case-by-case basis, that specific waste management practices pose a threat to public health or the

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environment. If this occurs, Ecology may require the generator to stop treatment and/or apply for a treatment permit. In rare circumstances a generator may need to enter into a consent order, which is a written agreement, with Ecology to proceed with a specific treatment process.

This TIM describes the self-implementing guidance which is as follows:

### **Fact Sheets**

Ecology believes that many generators may be able to treat their own wastes on-site, in containers or tanks, by using guidance contained in Focus Sheets that discuss specific types of treatment. The treatment may be performed by a person other than the generator (e.g., a contractor with a mobile treatment unit); however, it must be done at the site where the waste is generated. In addition to the guidance found in the appropriate Focus Sheet (and for treatment methods that are not one of the specific options), the standards in Section Four of this TIM apply and the rule amendment at WAC 173-303-170(3).

The Fact Sheets are self-implementing tools that generators can use for specific treatment methods. The following treatment methods are covered by six separate Fact Sheets:

Filtration	Carbon adsorption
Separation	Elementary neutralization
Evaporation	Solidification

These types of treatment must be performed in the generator's dangerous waste accumulation tank or container (see definitions below). Multi-stage, multi-vessel treatment (for example, treatment using more than one process in a series of vessels) is allowed.

### **Solid State-only Dangerous Wastes Treated in Units other than Tanks or Containers**

Treatment of solid state-only wastes (e.g., salt cake) may be performed in units other than tanks or containers. Such wastes must not contain free liquids as determined by the Paint Filter Liquids Test, Method 9095 of the EPA Publication Number SW-846, prior to treatment. In this situation, the state is not constrained by the federal regulations, since the wastes are not regulated under RCRA. For the same reason, Ecology is not constrained by EPA guidance (i.e., preamble language) for such wastes. However, Ecology encourages generators to use units other than tanks or containers as a "last resort" and after the option of using a tank or container has been thoroughly examined.

Generators may treat solid state-only dangerous waste in units other than tanks or containers, provided it is completed within the applicable accumulation time frame (either 90 or 180 days). The treatment unit must be designed, constructed and operated in a manner that prevents a release of waste and waste constituents. The treatment must not adversely affect the health of employees or the public. In addition, excessive noise is not

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allowed. Negative aesthetic impact on the use of adjacent property must be prevented. Lastly, inspections must be routinely performed and repairs conducted promptly.

## **Section Four: Standards that Apply to All Generators**

### **Performing Treatment by Generator**

The following standards apply to all generators who wish to perform treatment by generator, except small quantity generators [SQGs; see WAC 173-303-070(8)].

SQGs are encouraged to follow the General Performance and Safety Standards (see below), Ecology's recommended best management practices, any other standards contained herein that protect human health and the environment, and all applicable local regulations. Any situation that poses an actual or potential threat to public health or the environment may affect the conditional exemption of a SQG and cause them to become fully regulated under Chapter 173-303 WAC. Also, see below for applicability of treatment by generator at TSDs.

Some of these standards will not be relevant to the particular treatment by generator situation. For example, tank standards will not apply for those treating in containers only; cleanup standards will only apply if there is a release to the environment.

### **Accumulation Time Limit Standards**

The tank or container in which the treatment occurs must be appropriately marked with the date the accumulation period began. It must be emptied every 90 days (or 180 days for generators of 220-2200 lb/mo) and operated in compliance with certain portions of WAC 173-303-630 and WAC 173-303-640. There is no accumulation time limit for wastes being appropriately accumulated at satellite accumulation areas prior to treatment as long as the volume limit for satellite areas is not exceeded.

Exceeding the 90 (or 180) day limit constitutes storage which requires a storage permit. Any residues removed from a 90-day treatment unit remain subject to the 90-day accumulation time limit of the original waste placed in the unit. This means that a new 90-day limit does not begin for the residue when it is removed from a 90-day unit. The time limits also apply for multistage, multi-vessel processes.

### **Tank Definitions and Standards**

"Tank" means a stationary device designed to contain an accumulation of dangerous waste, and which is constructed primarily of non-earthen materials to provide structural support (see WAC 173-303-040). It is not to be confused with, and is not the same as a surface impoundment, waste pile or containment building.

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“Tank system” means a dangerous waste storage or treatment tank and its associated ancillary equipment and containment system (see WAC 173-303-040).

The following requirements for generators with accumulation tanks apply to treatment by generator processes in tanks (for generators of between 220 and 2200 pounds per month, the tank management standards in WAC 173-303-202 apply, instead):

1) WAC 173-303-640 sets treatment standards for tanks. Generators should pay special attention to the limitations of WAC 173-303-640(3),(9),(10), and (11). According to WAC 173-303-200, if the waste is placed in tanks, the generator must comply with WAC 173-303-640 (2) through (10) except for WAC 173-303-640 (8)(c) and the second sentence of WAC 173-303-640 (8)(a) (closure plan, cost estimate for closure, financial responsibility).

2) Owners or operators of new tank systems or components must obtain a written assessment. The assessment must be reviewed and certified by an independent, qualified registered professional engineer, attesting that the tank system has sufficient structural integrity and is acceptable for the treatment of dangerous waste. The assessment must show that the foundation, structural support, seams, connections, and pressure controls (if applicable) are adequately designed and that the tank system has sufficient structural strength, compatibility with the waste(s) to be treated, and corrosion protection to ensure that it will not collapse, rupture, or fail. Existing accumulation tanks that will be used for treatment will need to be reassessed if the proposed treatment will place stresses on the tank beyond what it was certified for, or if a major modification is performed. Also, in such cases the integrity assessment schedule may need to be modified.

## **Container Definition and Standards**

“Container” means any portable device in which a material is stored, transported, treated, disposed of, or otherwise handled (see WAC 173-303-040).

The following requirements for generators with accumulation containers also apply to treatment by generator in containers:

1) The generator must comply with all applicable parts of WAC 173-303-630, Use and Management of Containers, as referenced in WAC 173-303-200 or -201.

2) Generators must ensure that containers have sufficient structural integrity and are acceptable for the treatment of



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dangerous waste. This determination is based on applicable factors such as the container composition, structural support, type of cover, seam strength, etc. The container must be compatible with the waste(s) to be treated such that it will not corrode, collapse, rupture, or otherwise fail to contain the dangerous waste during treatment.

## **General Performance and Safety Standards**

The performance standards of WAC 173-303-283 (3) apply to all generators who treat their waste on-site.

In addition, whenever any generator chooses treatment by generator as a waste management option the treatment process may not, under any circumstances:

- (1) Generate extreme heat or pressure, fire or explosion, or violent reaction;
- (2) Produce uncontrolled toxic mists, fumes, dusts, or gases in sufficient quantities to threaten human health or the environment;
- (3) Produce uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of fire or explosions;
- (4) Damage the structural integrity of the facility or device containing the waste; or
- (5) Through other similar means, threaten human health or the environment.

## **Reporting Standards and Recordkeeping**

Notification on Form 2, and Annual Reporting on Ecology's Dangerous Waste Annual Report Forms is required. Notification requirements are found in WAC 173-303-060 and the reporting requirements are in WAC 173-303-220. When notifying on the Form 2, generators must complete the form by following the instructions and note in the comment section:

- (1) Whether the process is treatment by generator.
- (2) Whether the treatment is a multistage and/or multi-vessel process.
- (3) Whether it is being done in accordance with a specific Fact Sheet (or if not, that the TIM and applicable rules are being followed).

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The Form 2 must be submitted prior to beginning the treatment process. If the generator already has a RCRA ID#, a revised Form 2 must be submitted. Those generators that have received written Ecology approval for treatment by generator prior to the date of this revised TIM are also required to submit a Form 2.

For annual reporting and generator status determinations, the total quantity (as wet weight) of waste generated prior to treatment and the weight of any remaining material that designates after treatment, must be counted.

The waste prior to treatment and residuals (material remaining after the process) must be designated and managed appropriately. Also, the “derived from” rule [see WAC 173-303-070(2)] applies for listed wastes.

Generators must maintain a written log of the quantity of each dangerous waste managed on-site, the treatment methods, and dates of treatment.

### **Personnel Training, Preparedness and Prevention, Contingency Plan and Emergency Procedures, and Emergencies**

Generators who treat on-site must meet the requirements for facility operators contained in WAC 173-303-330 through 173-303-360. In lieu of the contingency plan and emergency procedures required by WAC 173-303-350 and 173-303-360, if a person generates between 220 pounds (100 kg) and less than 2200 pounds (1000 kg) per month and does not accumulate on-site more than 2200 pounds (1000 kg) of dangerous waste, the reduced standards in 173-303-201(2)(c) apply.

### **Cleanup Standards**

Cleanup of releases at generator sites must include any releases of hazardous waste that pose a threat to human health and the environment. Such cleanups are covered under the “imminent hazard” provisions of RCRA Section 7003, WAC 173-303-050 and -145.

### **Closure Standards**

Closure of 90/180 day generator accumulation units must be done in accordance with applicable closure (and post-closure, if necessary) performance standards.

For tanks, the closure requirements are found in WAC 173-303-640(8), except for (8)(c) and the second sentence of (8)(a). Containers must be closed in accordance with 40 CFR 265.111 and 265.114. These activities may include removal of waste residues with proper disposal and/or decontamination of equipment, structures and soils. Requirements for a closure plan, closure activities, cost estimates for closure, and financial responsibility specified in WAC 173-303-610 and 173-303-620 do not apply. The closure standards for generators of between 220 (100 kg) and 2200 pounds (1000 kg) per month who treat their dangerous waste in tanks must comply with the closure standards in WAC 173-303-202(4).

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## TSD Standards

TSDs that treat dangerous waste received from off-site may not treat that waste or any waste(s) derived from it according to the treatment by generator provisions. Generators that treat only their own dangerous waste on-site in tanks or containers (or other unit if solid state-only waste) and who have obtained interim status, a full permit, or have a Part B application pending may find it preferable to use treatment by generator rather than continue with the TSD permit process. Such facilities will need to comply with withdrawal of permit and/or closure requirements.

## Land Disposal Restriction Standards

Federal land disposal restriction (LDR) requirements (40 CFR 268 which is incorporated by reference at WAC 173-303-140(2)(a)) apply. The generator must develop a Waste Analysis Plan (WAP) for on-site treatment in tanks or containers not subject to permit requirements (i.e., Treatment by Generator) if the treatment is for the purpose of meeting the LDR standards or to make the waste nonhazardous. Compliance with the treatment standards for ignitable and corrosive wastes requires that hazardous constituents “reasonably expected to be present” in the waste be treated to specified standards. The WAP must be maintained as a facility record and filed with Ecology 30 days prior to beginning the treatment activity.

## Permit-by-Rule Standards

The permit-by-rule (defined at WAC 173-303-040) provisions of WAC 173-303-802(5) may apply in cases that would seem to qualify as treatment by generator. For example, a generator may treat wastes in a wastewater treatment unit, elementary neutralization unit or totally enclosed treatment facility, thereby discharging a wastewater. When this occurs, the permit by rule regulatory provisions in WAC 173-303-802(5) apply instead of the treatment by generator rules and guidance.

## Future Changes and Additional Information

Should EPA or Ecology later decide to modify the accumulation rules or specific standards for treatment in tanks or containers, the generator requirements may change.

For more information on treatment by generator options, contact a hazardous waste specialist at the appropriate phone number provided below, or the Hazardous Waste Technical Assistance and Policy Section at (360) 407-6700.

Northwest Region 425-649-7000  
Central Region 509-575-2490  
Industrial Section 360-407-6916

Southwest Region 360-407-6300  
Eastern Region 509-456-2926  
Nuclear Waste 360-407-7100

**Ecology is an equal opportunity agency. If you have special accommodation needs, or require this document in an alternate format, please call the Hazardous Waste and Toxics Reduction Program at (360) 407-6700 (Voice) or (360) 407-6006 (TDD).**

## Appendix G: Resources

The Organization Resources Counselors and the Metalworking Fluid Stewardship have co-published a report titled “Metal Removal Fluids: A Guide to their Management and Control.” This report is an excellent resource for any company using metal working fluids. A free of this report can be downloaded at <http://www.mwfp.org/>.

The Institute of Advanced Manufacturing Sciences (IAMS) has done substantial work with the metal machining industry sector. Currently they are working on developing a test method to compare metal working fluids. For more information visit their website at <http://www.iam.org>.

Another good source for information about metal fabrication can be found on the Pacific Northwest Pollution Prevention Resource Center’s website. Their web address is <http://pprc.pnl.gov/pprc/>.

### **Material Safety Data Sheets (MSDS) and Chlorinated Compounds**

MSDS sheets are a good starting point when trying to find out if a metal working fluid (MWF) contains chlorine. However, not all chlorinated compounds are required to be listed on a MSDS sheet. Therefore it cannot be assumed that chlorinated compounds are not present in the MWF merely because they aren’t listed in the MSDS. In order to be certain that the MWF is chlorine free, you need to call the manufacturer or supplier. Ask for written documentation that verifies that there are no chlorinated compounds in the MWF.

There are two parts of an MSDS sheet that may contain information about chlorinated compounds. Below is some general guidance about MSDS sheets. Please note that all MSDS sheets are NOT in the same format.

1. First, find Section 2 of the MSDS. This section is sometimes titled “Product Composition, Hazardous Ingredients Information, or Hazard Identification.” Look through the ingredients list for the words “Cl, chloro, chlorine, or chlorinated.” If it contains any of these words then the MWF contains chlorinated compounds.

2. If chlorinated compounds have not been found in Section 2, next look in Sections 4 or 5, which are usually titled “Fire and Explosion Hazard Data” or “Reactivity Data.” Find the line items titled “Hazardous Decomposition Products or By Products.” Look for any chlorinated compounds in the list. Some examples include hydrochloric acid (HCl) or oxides of chlorine.

## Appendix H: Bibliography

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